Protective Cooling Catalog

EDITION 10.1

Air Conditioners, Heat Exchangers & Custom Solutions for Closed-Loop Electronic Systems

McLean®
COOLING TECHNOLOGY

Protecting Electronics. Exceeding Expectations.™

Pentair
Technical Products

Quick Reference

Use this handy table to match your electronic cooling requirements with the most effective McLean protective cooling solution.

	Air Conditioners					Heat Exchangers	
	New SPECTRACOOL™ Pages 18-33	GENESIS® Pages 68-91	PROAIR™ Pages 92-103	T-Series™ Pages 34-67	Water-Cooled Pages 104-113	PROAIR™ Pages 114-131	CLIMAGUARD™ Pages 132-147
SYSTEM APPLICATION							
For indoor industrial	■	■	■	■	■	■	
For harsh / corrosive environments	■		■				■
For wash-down applications			■				
For data networking cabinets			■				
For outdoor enclosures	■		■	■			■
For telecommunications shelters				■			■
TEMPERATURE OF THE ELECTRONICS							
Cooler than outside the enclosure	■	■	■	■	■		
Warmer than outside the enclosure						■	■
AIR CONDITIONER COOLING CAPACITY							
1000-2000 BTU/Hr (300-700 Watts)		■	■	■			
4000-6000 BTU/Hr (1200-1800 Watts)		■	■	■	■		
8000-12000 BTU/Hr (2300-3500 Watts)	■	■	■	■	■		
20000 BTU/Hr (5900 Watts)	■			■			
2-ton 23500 BTU/Hr (6900 Watts)				■			
3-ton 42000 BTU/Hr (12300 Watts)				■			
5-ton 59000 BTU/Hr (17300 Watts)				■			
HEAT EXCHANGER COOLING CAPACITY							
Less than 20 Watts/°F (30 Watts/°C)						■	
20-60 Watts/°F (30-100 Watts/°C)						■	■
More than 60 Watts/°F (100 Watts/°C)							■
POWER INPUT							
115 & 230 AC Volt	■	■	■	■	■	■	■
400 / 460 AC Volt 3-phase	■	■					
24 & 48 DC Volt				■			■
MOUNTING							
Side	■	■	■	■	■	■	■
Top		■					
Rack			■		■		
CABINET PROTECTION							
Type 12	■	■	■	■	■	■	■
Type 3R	■		■	■		■	■
Type 4	■		■	■			■
Type 4X Stainless Steel	■		■	■			
CABINET DIMENSION							
Fits 8" / 203 mm				■		■	
Fits 12" / 305 mm			■	■		■	
Fits 16" / 406 mm		■	■	■	■	■	■
Fits 20" / 508 mm or larger	■	■	■	■	■	■	■

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McLean COOLING TECHNOLOGY

Table of Contents

New Product Overview 2
SPECTRACOOL™ Indoor & Outdoor Air Conditioner..... 2
CLIMAGUARD™ Outdoor Heat Exchanger 3

Why Use Pentair Technical Products 4

Why Use McLean Cooling Technology 5

How To Select A Protective Cooling Solution

Protective Cooling Solution Overview
Why cool electronics in the first place? 6
Heat Ruins Electronics 6
Sources of Heat 6
Trend Toward More Damaging Heat 6
What are the consequences of damaging heat? 6

Options for Cooling Electronics
Conductive Cooling 7
Fresh Air Cooling 7
Protective Cooling 7

Levels of Electronic Enclosure Protection
Protection Levels 8
SCCR Requirements per UL (Condensed version) 9

Selecting the Right Cooling Solution
Cooling Solution 10
Cooling Solution Choices 11

How to Select the Right Cooling Capacity Air Conditioner
Air Conditioner Cooling Capacity Overview 12
How to Determine Internal Heat Load 12
How to Determine Heat Transfer Load Overview 13
Simple Chart Method 13
Equation Method 14
How to Determine Total Heat Load 14

How to Select the Right Cooling Capacity Heat Exchanger
Heat Exchanger Cooling Capacity Overview 15
How to Determine Internal Heat Load 15
How to Determine Heat Transfer 15
How to Determine Heat Exchanger Capacity 16

SPECTRACOOL™ Indoor and Outdoor Air Conditioners 18

Indoor and Outdoor Base Models 20
G52 Indoor Model 21
G57 Indoor Model 28

T-Series Indoor/Outdoor Air Conditioners 34

Indoor/Outdoor Air Conditioners 36
T15 Model 37
T20 Model 40
T29 Model 43
T43 6000 BTU Model 46
T43 8000 BTU Model 48
T43 10000 BTU Model 50
T50 Model 53
T53 Model 56
T62 Model 59
T70-36 Model 62
T70-60 Model 65

GENESIS® Indoor Air Conditioners 68

Indoor Air Conditioners 70
M13 Models 1000 BTU/Hr. 71
M17 Models 1800 BTU/Hr. 73
M28 Models 2200 BTU/Hr. 75
M28 Models 4000 BTU/Hr. 76
M28 Models 6000 BTU/Hr. 77
M33 Models 4000 BTU/Hr. 79
M36 Models 6000 BTU/Hr. 81
M52-3 Phase Models 4100-10000 BTU/Hr. 83

GENESIS® Top-Mount Air Conditioners 86

Top-Mount Air Conditioners 88
MHB11 Models 2200 BTU. 89
MHB11 Models 4000 BTU 90

PROAIR™ Harsh Environment / Wash Down Air Conditioners 92

Harsh Environment / Wash Down Air Conditioners 94
CR23 Model 95
CR29 Model 98
CR43 Model 101

Water-Cooled Air Conditioners 104

Water-Cooled Air Conditioners 106
33WC Model. 107
CR43 Model 109
LB11WC Model. 111

PROAIR™ Indoor Heat Exchangers 114

Indoor Heat Exchangers 116
XR20 Model 117
XR29-08 Model 119
XR29-18 Model 121
XR47-24 Model. 123
XR47-35 Model 125
XR60-55 Model 127
XR60-84 Model 129

CLIMAGUARD™ Outdoor Heat Exchangers 132

Outdoor Heat Exchangers 134
TX23 Indoor Model 135
TX33 Indoor Model 138
TX38 Outdoor Model 141
TX52 Outdoor Model 144

Engineered Solutions 148

Aftermarket Customer Support

Terms and Conditions - Warranty
Terms and Conditions 150
Warranty 151
Return and Repair Policy 152

Model Number Index 154

Aftermarket Services - Global Field Repair Network 156

SPECTRACOOL™ Indoor & Outdoor Air Conditioner

Makes electronics cooling easier, so you can go about your business

Calm, cool and collected

EARTH-FRIENDLY

- Rotary compressor delivers up to 50% greater energy efficiency
- R134a earth-friendly refrigerant
- Produces 68 dB, quieter than other traditional air conditioners
- RoHS compliant

EASY INSTALLATION

- 30 pounds (14 kilograms) lighter than the T50 Outdoor Air Conditioner
- UL Listed, saving customers time and money by having agency approvals
- Built-in installation hooks on the back of each unit
- Cut-out adapters for enclosures with GENESIS® and T-Series Air Conditioners, enabling users to easily transition to the new models

CLEAN APPEARANCE

- Attractive industrial design
- Minimal use of visible fasteners
- RAL 7035 light gray powder-coat paint in a semi-texture finish
- Other paint colors and textures available

VERSATILE COOLING

- Indoor and outdoor models
- 8000, 12,000 & 20,000 BTUs/Hr (2300, 3500 & 5900 Watts) of cooling with other capacities available in 2010
- 115, 230 and 460 3-phase AC volt power input with +/- 10% operating range
- Exterior and partially recessed mounting options

Type 12/3R/4 **Type 4X** *optional*

c UL US LISTED CE

RELIABLE PERFORMANCE

- Operating temperature range:
  - -40 F/-40 C to 131 F/55 C outdoor
  - 50 F/10 C to 131 F/55 C indoor
- UL Type 12/3R/4 rated and Telcordia GR-487 capable
- IP34 rated for incoming ambient air
- IP56 rated for air moving from the AC into the enclosure
- Type 4X stainless steel option available
- All-metal shroud to better-withstand rugged factory and outdoor environments
- Dual condenser-side air movers for performance redundancy
- Washable metal filter to keep coil clean for maximum performance
- Made in an ISO 9001 certified facility
- Thoroughly tested during engineering development to withstand vibration and perform in virtually any environment
- Every unit functionally tested before shipping

EASY TO SPECIFY

- Standard indoor air conditioner has:
  - Condensate management heater strip
  - Power-off relay for door switch
  - Malfunction switch
- Standard outdoor air conditioner has:
  - Telcordia GR-487 capability
  - Corrosion-resistant components
  - Malfunction switch
  - Compressor heater
  - Head pressure control
  - 2000 watt enclosure heater

RESPONSIVE CUSTOMER SERVICE

- Popular models in-stock, ready for immediate shipment
- Backed by a 1-year standard warranty
- Over 1,000 field repair technicians worldwide
- Secure and easy-to-use online spare parts store

SPECTRACOOL's Key Advantages

1. UL Listed, saving customers time and money by having agency approvals
2. Built-in flanges on back and 30 lb. (14 kg) lighter for easy installation

3. R134a rotary compressor for greater energy efficiency and environmental friendliness
4. Clean attractive design, adding value to the electronic system's aesthetics
5. Rugged all-metal shroud for demanding factory and outdoor environments

6. Dual condenser-side impellers for performance redundancy
7. Easy-to-access metal filter and other components for fast service and less system downtime

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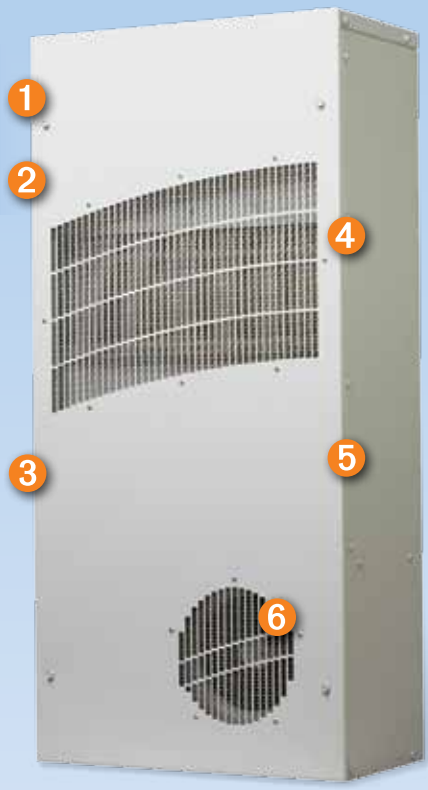
CLIMAGUARD™ Outdoor Heat Exchanger

Lab- and field-tested to seal out harsh environments



Stands tough against mother nature

EARTH-FRIENDLY

- Consumes less energy than traditional air conditioners
- RoHS compliant

VERSATILE COOLING

- Removes up to 3000 watts of enclosure heat
- Works with 24 VDC, 48 VDC, 115 VAC and 230 VAC power input
- Surface- and recess-mount options
- Up to 2000 watt heater selection on DC and AC volt models

RUGGED DESIGN

- Engineered for extreme climate conditions
  - -40 F/-40 C to 149 F/65 C operating temperature range
- UL Type 12/3R/4 rated and Telcordia GR-487 capable
- Powder-coated galvanized sheet metal shroud
- UL Type 4X stainless steel option available
- Corrosion–resistant aluminum core

RELIABLE PERFORMANCE

- Every core double-sealed for maximum weather protection
- Few moving parts
- Made in an ISO 9001 certified facility
- Every unit functionally tested

Goes easy on human nature

QUIET

- Variable-speed blowers standard on DC-powered units for quieter operation

EASY TO USE

- UL Listed, saving customers time and money by having agency approvals
- Built-in installation hooks on the back of each unit
- Filterless capable for most operating environments

RESPONSIVE CUSTOMER SERVICE

- Popular models in-stock, ready for immediate shipment
- Backed by a 1-year standard warranty
- Over 1,000 field repair technicians worldwide
- Secure and easy-to-use online spare parts store

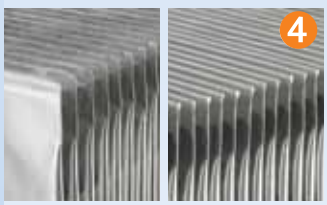
Type 12/3R/4 **Type 4X** *optional*

c UL US LISTED

CE

CLIMAGUARD's Key Advantages

1. UL Listed, saving customers time and money by having agency approvals
2. Built-in hooks to hang unit before fastening to cabinet for easier installation
3. DC- and AC-volt power input options to work in a variety of systems without power conversion



4. Double-sealed core for maximum protection against extreme weather
5. Powder-coated galvanized metal construction with stainless steel option that stands up to harsh environments
6. DC-volt models operate at variable speeds, producing less noise

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Pentair Technical Products Awarded for Exceptional Customer Service by Northrop Grumman, A Premier U.S. Defense Contractor

Pentair Technical Products received a 2008 Customer Service Award from Northrop Grumman for exceptional performance on critical Homeland Defense contracts. The Northrop Grumman award recognized select vendors who play a critical role in helping the company successfully fulfill its US government and other major contracts.

Northrop Grumman selected the McLean brand to provide the cooling solution for the Biohazard Detection System (BDS) developed for the US Postal Service. Part of the project's challenge included managing the heat load generated from the sensitive electronics utilized in the system and from varying environmental conditions.

"The Pentair Technical Products team stepped up to the challenge with the development of an air conditioner that had the right level of cooling, service life and other key features. They also provided the post-deployment service support that was needed," said Ann Schofield, BDS programs director at Northrop Grumman. "Our entire supplier experience with Pentair Technical Products proved to be exceptional, leading us to select them for the service award."

The Northrop Grumman award affirmed the customer-focused culture at Pentair Technical Products. Some companies put customer service in their mission statements; Pentair Technical Products actually lives by it.

No company engineers and services cooling solutions for vital electronics better than

Pentair Technical Products

With more than 30 years of experience producing everything from fan assemblies to standard air conditioners and heat exchangers to engineered cooling applications for one-of-a-kind systems, the Pentair Technical Products McLean brand has the people and products to deliver the cool. The markets we serve include industrial automation, food and beverage, telecommunications, petrochemical, transportation, data networking, security and defense, and many others.

Pentair Technical Products understands your need for performance and does whatever it takes to ensure that when you make a promise to a customer, you can keep it.

PRODUCT SELECTION

Indoors or out, McLean air conditioners, heat exchangers, air movers and controls get the job done.

ENGINEERED COOLING SOLUTIONS

An experienced staff with advanced software, rapid prototyping and in-house test facilities delivers engineered cooling solutions quickly and to your exact specifications.

TECHNICAL EXPERTISE AND SUPPORT

With over 30 years of experience across dozens of industries, our engineers are able to assist your project design every step of the way. We also put that same cooling know-how into the standard platform solutions that we develop for the broader market.

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Why Use Pentair Technical Products McLean Brand Cooling Technology

PRODUCT RELIABILITY

Speak with McLean customers, and you'll discover a strong market reputation for product reliability. We are ISO 9001:2008 certified. Every unit is also functionally tested before shipping.

EXPERIENCED SALES STAFF

Years of cooling systems expertise, engineering knowledge and responsive problem solving help our sales staff "listen, learn, develop and deliver."

ONLINE PARTS ORDERING

An easy-to-navigate online parts store provides fast, secure replacement part ordering 24/7.

FISCALLY STRONG

The Pentair Technical Products McLean brand is owned by Pentair, a $2.7 billion diversified, publically held global operating company. We handle single-unit in-stock orders to $5 million+ global projects.

GLOBAL REACH

McLean's growing worldwide network of sales, distribution and manufacturing delivers quality service for those who need global infrastructure.

SUPERIOR SERVICE AND REPAIR

Over 1,000 certified repair technicians provide 24-hour emergency service worldwide.

COOL CUSTOMER SUCCESSES Thomson and McLean Are Shaken, But Not Stirred

Thomson Broadcasting is the world leader in digital video technologies. That's why top media, entertainment and communications companies turn to Thomson to get the right images to the right place at the right time – over time.

And that's why Thomson turns to the McLean brand to help keep its customers' broadcast systems up and running 24/7.

"We recently tested a new UHF base station for one of our clients," said Don Wike, Chief Design Engineer. "We put our system, including a McLean outdoor air conditioner, through a pretty rigorous Telcordia GR-487 test protocol. We shook the UHF system, dropped it from over 18 inches, and simulated years of cold winters and hot summers in a cycle chamber. After all this, the McLean unit still performed beautifully."

Don added, "Our customers count on Thomson to design a rugged digital media system. And we count on McLean to keep the electronics cool. We had over 8,000 watts of heat to dissipate in the new UHF base station system. The McLean 3-ton A/C unit proved it can handle the load. Pentair Technical Products also allowed us to use their thermal cycle test chamber, saving us R&D costs."

For electronics cooling that performs under extreme conditions, take a serious look at McLean. More cool customer stories are available at **McLeanCoolingTech.com**

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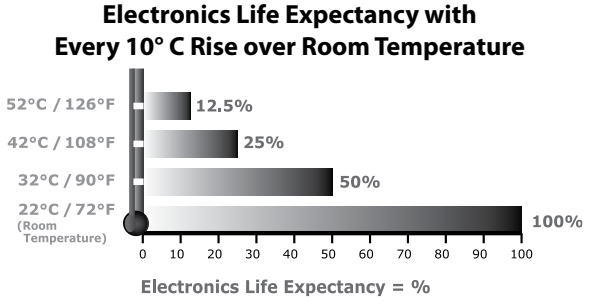
Protective Cooling Solution Overview

Why cool electronics in the first place?

Keeping your electronics cool is essential to extending their life and keeping your business running.

Heat Ruins Electronics

The life expectancy of electronics is cut in half every 10 C / 18 F they operate above room temperature. Operating electronics above certain temperatures can void manufacturers' warranties, making proper cooling essential. Cooling vital electronics increases service life and reduces capital expenses over the long-term.



Sources of Heat

Damaging heat can come from a variety of sources. Inside the cabinet, heat can stem from:

- AC power supplies
- Controllers, drives and servos
- Transformers and rectifiers
- Processors and server racks
- Radio equipment
- And other electronic components

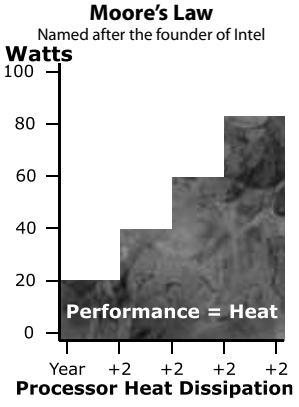
Heat also comes from outside the enclosure through sources such as:

- Solar heat gain
- Welding processes
- Paint oven
- Blast furnace
- Foundry equipment

Trend Toward More Damaging Heat

For the foreseeable future, the trend is toward increasing levels of heat in electronics, not less. The reason is that the market's thirst for more information processing capacity and speed continues to grow. This trend is known as "Moore's Law."

The use of more powerful data-processing electroics generates extra heat with virtually every new system that is designed. There is no guarantee that an application that did not require much, if any, cooling in the past will not need any in the future. Odds are the new system has more functionality and consequently will likely require some form of cooling.



What are the consequences of damaging heat?

Heat build-up can adversely affect industrial control and sensitive electronic systems as follows:

- De-rated drive performance
- I/C-based devices experience intermittent fluctuations
- MTBF decreases exponentially
- Catastrophic failure

The costs when a factory line or electronic system fails can include:

- Productivity losses
- Component replacement costs
- Late shipments
- Customer dissatisfaction
- Lost revenue
- Cell phone tower outage
- Breach in homeland security

Direct costs to a business can be as much as $50,000 per hour of system downtime.

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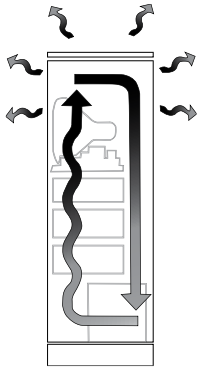
Options for Cooling Electronics

Conductive Cooling

This is a passive way to cool electronics. It simply allows the heat to radiate through the cabinet walls.

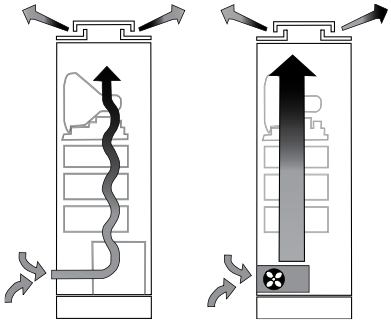


Conductive cooling works well with electronics systems that have small heat loads (<50 Watts) and cool air around the enclosure (<78 F/25 C).

If heat is an issue, one option within this type of cooling is to increase cabinet size to create more surface area to speed the transfer of heat. However, growing cabinet size is often not a practical solution because of space limitations and the greater heat loads associated with today's high-power electronics.

Fresh Air Cooling

This is an active way to manage heat in electronics applications. This type of cooling ventilates fresh air through the cabinet, exhausting heat away from the hot components.

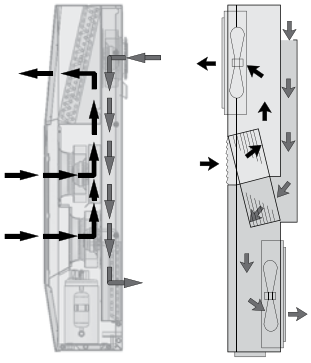


Fresh air cooling may be used when the electronics system is deployed in a relatively clean and cool environment such as an office building, data networking center or light-duty factory. Options for cooling electronic enclosures with fresh air include filter fans, fan trays, motorized impellers and packaged blowers.

Fresh air cooling is known as an "open-loop system" because no significant seal is maintained to protect electronic components from harmful elements such as dirt, water, metal filings and corrosive fumes.

Protective Cooling

This is also another active way to cool electrical components. This type of thermal management maintains the seal of the enclosure—using an air conditioner or heat exchanger as examples—to remove heat from inside the electronics cabinet.



Air Conditioner Heat Exchanger

Protective cooling is generally required when (1) the electronics application is operating in high temperatures, typically over 95 F/35 C, (2) deployed in a harsh environment such as an outdoor telecom base station, wastewater treatment plant, metal working operation, oil rig platform, paper mill, foundry and/or (3) generating a high heat load from its own components, usually more than 500 Watts.

Options for protective cooling include air conditioners, air-to-air heat exchangers, air-to-water heat exchangers, thermo-electric coolers and vortex coolers.

Protective cooling is known as a "closed-loop system" because the seal of the electrical cabinet is maintained, allowing no elements which can damage the electronics inside the enclosure.

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Levels of Electronic Enclosure Protection

Protection Levels

NEMA, UL and CSA Ratings **Enclosure Type Descriptions for Non-Hazardous Locations**

	Type	NEMA	UL	CSA
Indoor	Type 1	Enclosures are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment or locations where unusual service conditions do not exist.	Indoor use primarily to provide protection against contact with the enclosed equipment and against a limited amount of falling dirt.	General purpose enclosure. Protects against accidental contact with live parts.
Indoor	Type 12	Enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt and dripping noncorrosive liquids.	Indoor use to provide a degree of protection against dust, dirt, fiber flyings, dripping water and external condensation of noncorrosive liquids.	Indoor use; provides a degree of protection against circulating dust, lint, fibers and flyings; dripping and light splashing of non-corrosive liquids; not provided with knockouts.
Indoor	Type 12K	Enclosures with knockouts are intended for indoor use primarily to provide a degree of protection against dust, falling dirt and dripping noncorrosive liquids.	Indoor use to provide a degree of protection against dust, dirt, fiber flyings, dripping water and external condensation of noncorrosive liquids.	Indoor use; provides a degree of protection against circulating dust, lint, fibers and flyings; dripping and light splashing of noncorrosive liquids; not provided with knockouts.
Indoor	Type 13	Enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil and noncorrosive coolant.	Indoor use to provide a degree of protection against lint, dust seepage, external condensation and spraying of water, oil and noncorrosive liquids.	Indoor use; provides a degree of protection against circulating dust, lint, fibers and flyings; seepage and spraying of non-corrosive liquids, including oils and coolants.
Outdoor	Type 3	Enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain and sleet; undamaged by the formation of ice on the enclosure.	Outdoor use to provide a degree of protection against windblown dust and windblown rain; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain, snow and windblown dust; undamaged by the external formation of ice on the enclosure.
Outdoor	Type 3R	Enclosures are intended for outdoor use primarily to provide a degree of protection against falling rain and sleet; undamaged by the formation of ice on the enclosure.	Outdoor use to provide a degree of protection against falling rain; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain and snow; undamaged by the external formation of ice on the enclosure.
Outdoor	Type 3RX	Enclosures are intended for outdoor use primarily to provide a degree of protection against corrosion, falling rain and sleet; undamaged by the formation of ice on the enclosure.	Not specifically defined.	Not specifically defined.
Outdoor	Type 4	Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water and hose directed water; undamaged by the formation of ice on the enclosure.	Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water and hose-directed water; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain, snow, windblown dust, splashing and hose-directed water; undamaged by the external formation of ice on the enclosure.
Outdoor	Type 4X	Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water and hose-directed water; undamaged by the formation of ice on the enclosure.	Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water and hose-directed water; undamaged by the formation of ice on the enclosure; resists corrosion.	Indoor or outdoor use; provides a degree of protection against rain, snow, windblown dust, splashing and hose-directed water; undamaged by the external formation of ice on the enclosure; resists corrosion.
Outdoor	Type 6	Enclosures are intended for use indoors or outdoors where occasional submersion is encountered; limited depth; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use to provide a degree of protection against entry of water during temporary submersion at a limited depth; undamaged by the external formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against the entry of water during temporary submersion at a limited depth. Undamaged by the external formation of ice on the enclosure; resists corrosion.

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- This material is reproduced with permission from the Canadian Standards Association.
- Underwriters Laboratories Inc. (UL) shall not be responsible for the use of or reliance upon a UL Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon a UL Standard.
- Some enclosures may have multiple ratings. For instance: 4, 12—Outdoor use; able to be used indoors with modifications; 4X, 3RX—Outdoor use; able to be used indoors with modifications; 4, 9—Can be used in both hazardous and non-hazardous locations

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Levels of Electronic Enclosure Protection

IP Rating Descriptions **Example Rating**

If 1st IP number is...	and the 2nd ip number is...	Then the IP rating is
2	3	IP23
(protection against solid objects)	(protection against liquids)	An enclosure with this designation provides protection against touch with a finger, penetration of solid objects greater than 12mm, and spraying water.

First Numeral (Solid Objects and Dust)

IP	Protection of Persons	Protection of Equipment
0	No Protection	No Protection
1	Protected against contact with large areas of the body (back of hand)	Protected against objects over 50 mm in diameter
2	Protected against contact with fingers	Protected against solid objects over 12 mm in diameter
3	Protected against tools and wires over 2.5 mm in diameter	Protected against solid objects over 2.5 mm in diameter
4	Protected against tools and wires over 1 mm in diameter	Protected against solid objects over 1 mm in diameter
5	Protected against tools and wires over 1 mm in diameter	Protected against dust (limited ingress, no harmful deposit)
6	Protected against tools and wires over 1 mm in diameter	Totally protected against dust

Second Numeral (Liquid)

IP	Protection of Equipment
0	No Protection
1	Protected against vertically falling drops of water, e.g. condensation
2	Protected against direct sprays of water up to 15 degrees from vertical
3	Protected against sprays to 60 degrees from vertical
4	Protected against water sprayed from all directions (limited ingress permitted)
5	Protected against low-pressure jets of water from all directions (limited ingress permitted)
6	Protected against strong jets of water
7	Protected against the effects of immersion between 15 cm and 1 m
8	Protected against long periods of immersion under pressure

SCCR Requirements per UL (Condensed version)

Article 409 of the 2008 National Electric Code (NFPA 70) requires industrial control panels to be marked with a short circuit current rating. As specified in the National Electric Code, UL508A-2001 Supplement SB, the Standard of Safety for Industrial Control Equipment, provides an accepted method for determining the short-circuit current rating of the control panel.

The SCCR rating for our air conditioners and heat exchangers has a default value of 5 kA.

You may use a 5 or 10 kVA isolation transformer between the customer's panel and our air conditioner and not have an effect on the customer's 65 kA rating.

You may use a fuse or circuit breaker with a 5 kA short circuit rating on the line side of the ACU and its branch circuit protective device and not have an effect on the customer's 65 kA rating.

The current limiting fuse or circuit breaker used on the line side of the branch circuit protection for the ACU must have a SCCR => that of the panel rating. Additionally for a current limiting fuse the customer would need to verify using table SB4.2 of UL 508A, that the let through current (Ip * 10^3) of the fuse is <= 5KA. If a circuit breaker is used as feeder protection, it **must** be marked Current Limiting type from the manufacturer, and the panel builder would need to verify based on the manufacturers published curves that it will let through <= 5kA. Examples of these curves are included in UL 508A supplement SB.

You can run separate circuits for the panel and the air conditioner as long as each is labeled with their individual SCCR ratings.
(5 kA and 65 kA)

If the customer does not implement one of the options above, then the resulting SCCR rating would be the 5 kA rating of the ACU, if that is the lowest rated component in the panel.

Testing represents another option; however, if the customer does not implement these options, then the resulting short circuit rating of the panel is based on the lowest short circuit current rating of all power circuit components installed in the panel.

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Selecting the Right Cooling Solution

Cooling Solution

Since heat dissipation is often not a solution, we will limit our choices to protective vs. fresh air cooling.

Use the environmental and electronic system criteria in the table below to determine whether protective or fresh air cooling meets the needs of your application.

Protective vs. Fresh Air Cooling

Specifying protective cooling that keeps your electronics components sealed from the outside environment versus using fresh air cooling to remove damaging heat depends on the following profile of your system application (check one side or the other for each of the six choices):

PROTECTIVE			FRESH	
Dirty / Wet / Metal Filings / Outdoors / Corrosive Fumes	☐	**SYSTEM OPERATING ENVIRONMENT**	☐	Clean Air / Some Dust / Dripping Water
Hot (typically over 95 F / 35 C)	☐	**TEMPERATURE OUTSIDE OF THE ENCLOSURE**	☐	Moderate to Low (typically under 95 F / 35 C)
Below to Somewhat Above Ambient Temperature	☐	**TEMPERATURE RATING OF THE ELECTRONICS**	☐	Somewhat to Well-Above Ambient Temperature
High Relative Humidity	☐	**HUMIDITY OUTSIDE OF THE ENCLOSURE**	☐	Moderate to Low
Narrow / Precise	☐	**TEMPERATURE RANGE FOR THE ELECTRONICS**	☐	Wide
Moderate to High (typically over 3000 Watts)	☐	**SYSTEM POWER DRAW / HEAT LOAD**	☐	Moderate to Low (typically under 3000 Watts)

If most of your assessments were on the Protective side, then an air conditioner or heat exchanger found in this catalog is likely the right cooling solution for your electronics system. However, if most of your conclusions fell on the fresh air side, then a filter fan, fan tray, motorized impeller or blower is probably the correct cooling solution for your application. McLean in-stock and engineered air movers can be found in our Fresh Air Cooling Catalog for open-loop electronic systems.

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Selecting the Right Cooling Solution

Cooling Solution Choices

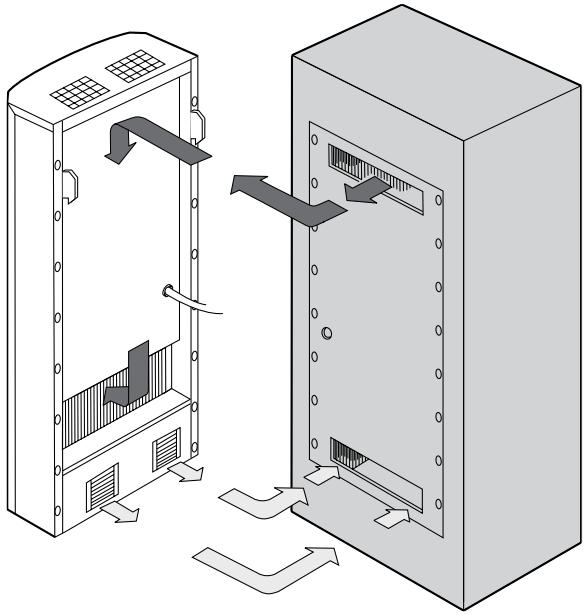
Assuming that protective cooling is needed for the application, there are two basic choices—air conditioners or heat exchangers.

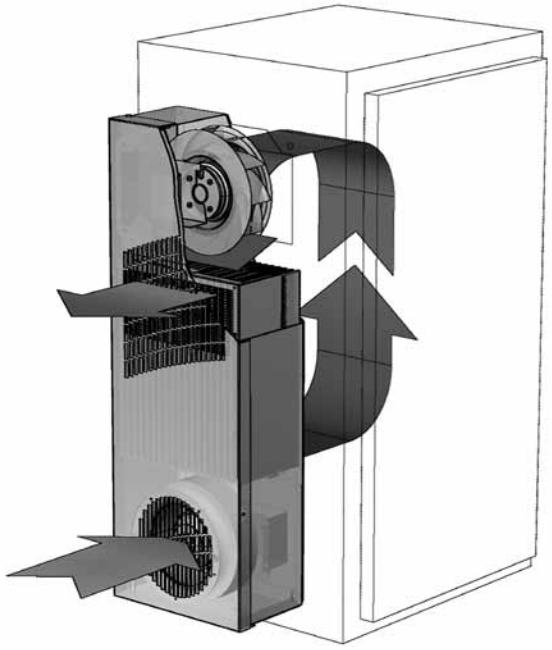
An air conditioner should be specified when:

- The temperature inside the enclosure must be maintained at or below the ambient temperature.
- Humidity must be removed.
- A moderate to high heat load is being produced by the electronic system.

A heat exchanger can be used to transfer heat from inside the enclosure to the outside atmosphere when:

- The electronic components can operate at a temperature above the ambient air.
- Humidity is not a factor.
- A low to moderate heat load is being produced by the electronic system.





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How to Select the Right Cooling Capacity Air Conditioner

Air Conditioner Cooling Capacity Overview

The cooling capacity of an air conditioner needs to match or exceed the amount of total heat generated by the electronic system which is known as "heat load."

Total heat load comes from two sources:
(a) the electronic components themselves which is called "internal heat load" and (b) the ambient heat outside the enclosure which is known as the "heat transfer load." Most engineers and cooling suppliers determine internal heat load. However, the impact from the heat transfer load is easily overlooked. Heat transfer load can significantly add to the total heat load of the system, especially if the outside air temperature is high and/or the enclosure is located in the sun.

Thus, the **total heat load** to be removed from the electrical enclosure by the air conditioner is the sum of the **internal heat load** and the **heat transfer load.**

TOTAL HEAT LOAD = INTERNAL HEAT LOAD + HEAT TRANSFER LOAD

How to Determine Internal Heat Load

The internal heat load stems from the amount of waste heat generated inside the enclosure by the electronic components and is expressed in terms of watts.

There are several methods to determine internal heat load, depending on data availability.

Method 1. Heat Load Data from Each Electronics Component Manufacturer

One way to estimate internal load is gather heat load data from the manufacturers of the electronics components inside the cabinet. They may know the amount of heat their equipment is generating. If more than one control or other electronics components are inside the enclosure, it will be necessary to add together the multiple estimates of heat load to determine total internal heat load.

Method 2. Component Power – Component Efficiency

A second method is to establish the watts of power used by each electronic component. Watts of power is derived by multiplying the amp draw of each device with its voltage. Then one subtracts the efficiency of each component from its estimated power use, adding up the outcomes for total internal heat load.

INTERNAL HEAT LOAD =
COMPONENT POWER (Watts) - COMPONENT EFFICIENCY
(for each electrical device)

Example—

An electronic system uses two components that draw 115 VAC at 15 amps. Each has a rated efficiency of 90%. Put another way, 10% of each device is inefficient. Unused portions of power become generated heat. Thus the estimated internal heat load is:

Device Power = 115 x 15 = 1725 Watts
Total Power = 2 x 1725 = 3450
Less Efficiency = 3450 x (1 - .90)
Total Heat Load = 345 Watts

Method 3. Incoming – Outgoing Power

A third approach is to estimate the power going into the enclosure and the power coming out of it. The difference becomes the estimated amount of internal heat load. The amps and volts of each electrical line going in are multiplied to determine watts, then they're added together. The same is done for the electrical line(s) coming out of the application. The outgoing watts are subsequently subtracted from the incoming watts.

INTERNAL HEAT LOAD =
INCOMING POWER (Watts) – OUTGOING POWER (Watts)

Example—

An enclosure has three input lines of 230 VAC at 11, 6 and 4 amps. It has one output control line of 115 VAC at 9 amps.

Incoming Power = (230 x 11) + (230 x 6) + (230 x 4) = 4830 Watts

Outgoing Power = 115 x 9 = 1035 Watts

Total Heat Load = 4830 – 1035 = 3795 Watts

Method 4. Automated Equipment Horsepower

This fourth method applies only to industrial automation equipment that operates with horsepower such as variable frequency drives (VFDs). 1 horsepower = 745.6 watts. Thus, the internal heat load from a 3-horsepower VFD is 2237 watts, less its efficiency which is typically 93% - 95%.

Example—

A cabinet has three 5-Hp VFDs with 95% efficiency.

VFD Watts = 5 Hp x 745.6 x 3 = 11184

Adjusted Watts = 11184 x (1 - .95) = 559

Total Heat Load = 559 x 1.25 = 699 Watts

NOTE: 1.25 is an assumed "safety" margin for other minor heat-producing components.

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How to Select the Right Cooling Capacity Air Conditioner

How to Determine Heat Transfer Load Overview

Heat transfer load is the ambient heat outside the enclosure conducting itself through the cabinet walls toward the electronics because heat energy travels from the hottest to coldest location.

When an air conditioner cools the enclosure temperature lower than the ambient air outside, additional heat load is drawn inside the cabinet which the air conditioner needs to remove. The higher the ambient temperature and/or the presence of solar heat gain (the "greenhouse effect") on the enclosure, the more cooling capacity is required.

Determining heat transfer load requires that you know the **total surface area** of the cabinet, less any non-conductive surface area such as the enclosure side mounted to a wall. It also requires that you determine **ΔT**, which is the difference between maximum ambient temperature and the maximum temperature rating of the electronics components.

There are two methods for determining heat transfer load—the simple chart method and the equation method.

Simple Chart Method

This method is reasonably accurate for most indoor industrial systems where there is no unusual air movement and insulation is not typically used inside the enclosure. The process also provides a ballpark result for outside plant and telecommunications applications, taking into account solar heat gain. However, it does not incorporate the impact of wind or cabinet insulation. If either is desired, then the equation method is more precise.

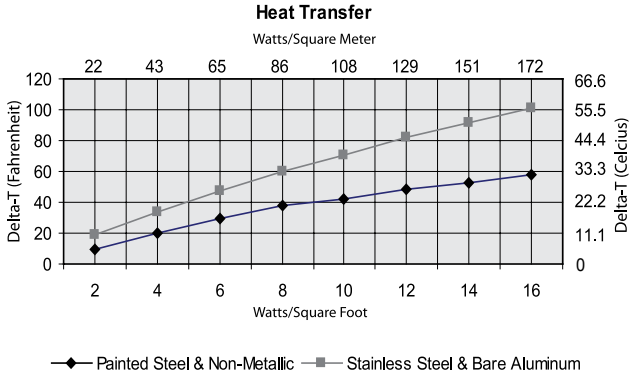
Here are the steps:

a. Determine ΔT in °F or °C
b. Find the Heat Transfer per sq. ft. or meter on the chart below, using ΔT and the proper cabinet material curve
c. Multiply the heat transfer per sq. ft. or meter by the total surface area of the enclosure that will conduct heat. (Remember to exclude surfaces such as a side mounted to a wall).

SURFACE AREA (Sq. Ft.) = [2AB (in.) + 2BC (in.) + 2AC (in.)] ÷ 144

SURFACE AREA (Sq. Meters) =
[2AB (mm) + 2BC (mm) + 2AC (mm)] ÷ 1000000

Total Heat Transfer Load =
Heat Transfer per Sq. Ft. or Meter x Cabinet Surface Area

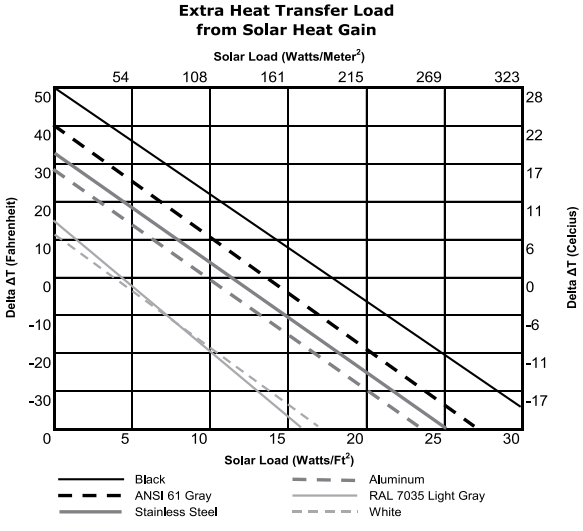

Heat Transfer
Watts/Square Meter
22 43 65 86 108 129 151 172
120 100 80 60 40 20 0
66.6 55.5 44.4 33.3 22.2 11.1 0
Delta-T (Fahrenheit)
Delta-T (Celcius)
2 4 6 8 10 12 14 16
Watts/Square Foot
Painted Steel & Non-Metallic
Stainless Steel & Bare Aluminum

Example —
A painted steel cabinet has 80 sq. ft. of surface area and will be located in a maximum ambient temperature of 95 F. The rated temperature of the electronics is 75 F.

ΔT = 95 - 75 = 20 F
Heat Transfer = 4 Watts/sq. ft. (from chart)

Total Heat Transfer Load = 80 x 4 = 320 Watts

The estimate for heat transfer load ends here, unless the electronic system will be deployed outdoors. Then solar heat gain needs to be added to the total heat transfer load calculated above. Solar heat gain is determined much the same way as heat transfer per sq. ft. or meter, using a similar chart.



Example — The painted cabinet above is in ANSI 61 gray. Thus, 7 Watts/sq. ft. needs to be added to the heat transfer load which is 560 Watts (7 x 80 Sq. Ft.). Total heat transfer load consequently becomes 720 Watts.

Note: The result does not include insulation which can significantly reduce heat transfer load.

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How to Select the Right Cooling Capacity Air Conditioner

Equation Method

Heat transfer load may also be determined by equation. This method should be used when at least one of the following criteria are found in the electronic system:

a. Moderate to high airflow within the cabinet
b. Outdoor applications that involve breezes or gusty winds
c. Insulation used within the cabinet to offset the impact of solar heat gain

The governing equation for Heat Transfer Load is as follows:

English System (°F, inches and feet) —
$q = (To_o - Ti_i) \div [(1/ho_o) + (1/hi_i) + R]$

Metric System (°C, millimeters and meters) —
$(q = (To_o - Ti_i) \div [(1/ho_o) + (1/hi_i) + R] \times 5.67$

Definition of Variables—
q = Heat transfer load per unit of surface area
To_o = Maximum ambient temperature outside the enclosure
Ti_i = Maximum rated temperature of the electronics components
ho_o = Convective heat transfer coefficient outside the cabinet
Still air: h = 1.6
Relatively calm day: h = 2.5
Windy day (approx. 15 mph): h = 6.0

Hi_i = Convective heat transfer coefficient inside the cabinet
Still air: h = 1.6
Moderate air movement: h = 2.0
Blower (approx. 8 ft./sec.): h = 3.0

R = Value of insulation lining the interior of the enclosure walls
No insulation: R = 0.0
1/2 in. or 12 mm: R = 2.0
1 in. or 25 mm: R = 4.0
1-1/2 in. or 38 mm: R = 6.0
2 in. or 51 mm: R = 8.0

$q = (125 - 75) \div [(1/6) + (1/2) + 4]$
$q = (50) \div (.16 + .5 + 4.0)$
$q = 50 \div 4.66$
$q = 10.7$ BTU/hr./sq. ft.

Total Heat Transfer Load
10.7 x 72 = 770 BTU/hr. or 770 ÷ 3.413 = 226 Watts

Since the cabinet is outdoors, and assuming it is painted ANSI 61 gray and located in the sun, extra solar load needs to be added to the outcome above which is 504 Watts (7 Watts per sq. ft. x 72 sq. ft.).

Total Heat Transfer Load with Extra from Solar Heat Gain
226 + 504 = 730 Watts

How to Determine Total Heat Load

Total heat load to be removed from the electrical enclosure by the air conditioner is the sum of **internal heat load** plus **heat transfer load**.

TOTAL HEAT LOAD (C) = INTERNAL HEAT LOAD (A) + HEAT TRANSFER LOAD (B)

Thus, one adds together the result from Part A in the methodology with the outcome from Part B.

Example—

The internal heat load from one of the examples above was 3795 Watts. The heat transfer load from the other example above was 730 Watts. Consequently, total heat load is 3795 + 730 = 4525 Watts.

To convert Watts into BTU/hr. to determine air conditioner capacity in the English system, multiply by 3.413.
4525 Watts is thereby 15444 BTU/hr.

Power input, protection level and dimensions of the air conditioner also need to fit system requirements.

Caution! Do not simply match the nominal cooling capacity of the air conditioner model with the total heat load result above. Be sure to know the maximum ambient temperature outside the enclosure as well as the rated temperature of the electronic components. Apply these temperatures to the performance curves provided by the cooling manufacturer to select an appropriately sized air conditioner. Failure to do so may under-size your air conditioner as much as 20% - 25%, thereby under-cooling the electronics and making the application vulnerable to potential over-heating issues.

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How to Select the Right Cooling Capacity Heat Exchanger

Heat Exchanger Cooling Capacity Overview

Cooling with an air-to-air heat exchanger assumes that the electronic components in your system are able to operate **above** the ambient temperature outside the enclosure. If this is not the case, then an air conditioner must be used.

Selecting a heat exchanger is similar to specifying an air conditioner in that the cooling capacity of the unit must remove the **internal heat load** from the electrical enclosure.

However, since the conductive cooling nature of the cabinet itself removes some of the heat from the system, **heat transfer** should be deducted from internal heat load (versus added in the case of air conditioners).

Because the cooling capacity of heat exchangers is expressed in terms of Watts/°F or Watts/°C, an extra step is necessary to convert net heat load into a result used to select the appropriate heat exchanger. This step is simply dividing the net heat load by the **ΔT** which is the difference between the maximum ambient temperature outside the enclosure and the maximum temperature rating of the electronic components.

HEAT EXCHANGER CAPACITY (C) = [INTERNAL HEAT LOAD (A) – HEAT TRANSFER (B)] / ΔT

How to Determine Internal Heat Load

Internal heat load stems from the amount of waste heat generated inside the enclosure by the electronic components and is expressed in terms of Watts.

To determine internal heat load, follow one of the four options outlined in the air conditioner "How to Determine Internal Heat Load" section on page 12.

How to Determine Heat Transfer

In the case of air-to-air heat exchangers, heat transfer is actually cabinet heat loss because the heat inside the enclosure is conducting itself through the cabinet walls toward the cooler temperature outside the enclosure. That is why heat transfer is deducted from internal heat load to arrive at total net heat load.

Determining heat transfer requires that you know the **total surface area** of the cabinet, less any non-conductive surface area such as the enclosure side mounted to a wall. It also requires that you determine **ΔT** which is the difference between maximum ambient temperature and the maximum temperature rating of the electronic components.

There are two methods to determine heat transfer—the **simple chart method** and the **equation method**. The simple chart method may be used for nearly all indoor heat exchanger applications. The equation method needs to be applied when air movement outside or inside the electrical enclosure is high, or for outdoor applications.

Here are the steps for the simple chart method:

d. Determine ΔT in °F or °C.
e. Find the heat transfer per sq. ft. or meter from the Heat Transfer graph on page 13, using ΔT and the proper cabinet material curve.
f. Multiply the heat transfer per sq. ft. or meter by the total surface area of the enclosure that will conduct heat. (Remember to exclude surfaces such as a side mounted to a wall.)

SURFACE AREA (Sq. Ft.) = [2AB (in.) + 2BC (in.) + 2AC (in.)] ÷ 144

SURFACE AREA (Sq. Meters) = [2AB (mm) + 2BC (mm) + 2AC (mm)] ÷ 1,000,000

Heat Transfer (Cabinet Heat Loss) = Heat Transfer per Sq. Ft. or Meter x Enclosure Surface Area

The estimate for heat transfer ends here, unless the electronic system will be deployed outdoors, or airflow inside or outside the enclosure is high. Then the equation method needs to be used to determine heat transfer (cabinet heat loss).

For the equation method, follow the steps on page 13 in the air conditioner selection section. The result will be a negative number; the negative sign should be ignored when deducting heat transfer from internal heat load.

Caution! If the result of the equation method is a positive number, this means you want the electronics temperature inside the cabinet to be lower than the temperature outside the enclosure. In this case, an air conditioner should be specified for the electronics system.

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How to Select the Right Cooling Capacity Heat Exchanger

How to Determine Heat Exchanger Capacity

Air-to-air heat exchanger capacities are not provided in terms of Watts or BTUs/hr. of cooling like air conditioners. Instead, they are expressed in terms of Watts/°F or Watts/°C. Thus, the final step in determining heat exchanger capacity is to simply divide total net heat load by ΔT. Then one selects the heat exchanger with the same or higher Watts/°F or Watts/°C as the outcome of this process.

—Indoor Industrial Example—

An electronic system uses two components that draw 230 VAC at 7.5 amps. Each has a rated efficiency of 90%. They are protected in a painted steel cabinet that is 60 in. (1524 mm) tall, 36 in. (914 mm) wide and 18 in. (457 mm) deep. The system will be located in a maximum ambient temperature of 80 F (27 C). The rated temperature of the electronics is 95 F (35 C).

HEAT EXCHANGER CAPACITY (C) =
[INTERNAL HEAT LOAD (A) – HEAT TRANSFER (B)] ÷ ΔT

Internal heat load (A) may be determined using the "Component Power – Component Efficiency" method on page 12, given the available information. In this example, the estimated heat load is as follows:
Device Power = 230 x 7.5 = 1725 Watts
Total Power = 2 x 1725 = 3450
Less Efficiency = 3450 x (1 - .90)
Internal Heat Load = 345 Watts

Heat transfer (B) is derived using the simple chart method, since this is an indoor industrial application. Both cabinet surface area and ΔT are needed to determine heat transfer. Cabinet surface area is 54 sq. ft. or 5.02 sq. meters (for surface area formula on page 13). ΔT is 15 F (8 C)—the difference between ambient temperature and the rated temperature of the electronics.

Heat Transfer (Cabinet Heat Loss) =
Heat Transfer per Sq. Ft. or Meter x Enclosure Surface Area

Using the painted steel curve on the Heat Transfer chart on page 13, heat transfer per sq. ft. or meter is 3 Watts/sq. ft. or 32.5 Watts/sq. meter.
Heat Transfer: 3 Watts/Sq. Ft. x 54 Sq. Ft. = 162 Watts

Now that we know internal heat load, heat transfer and ΔT, we can determine heat exchanger capacity as follows:

HEAT EXCHANGER CAPACITY (C) =
[345 WATTS (A) – 162 WATTS (B)] ÷ 15 F (or 8 C)

HEAT EXCHANGER CAPACITY (C) = 12 Watts/°F or 22 Watts/°C

The result is **minimum** heat exchanger capacity. If no heat exchanger model is similar to the result, choose the next largest size to ensure adequate electronics cooling.

Power input, protection level and dimensions of the heat exchanger also need to fit the system.

—Outdoor Example—

A telecom system draws a total of 5,000 Watts; its efficiency is 85%. It is protected in a painted steel cabinet that is 72 sq. ft. (6.69 sq. meters) and painted in an RAL 7035 light gray color. The enclosure walls are lined inside with 1 in. (25 mm) of insulation. The application will be deployed in a maximum ambient outdoor temperature of 104 F (40 C) with occasional winds reaching 15+ mph. The rated temperature of the electronics is 114 F (46 C). Air circulation inside the cabinet is moderate.

HEAT EXCHANGER CAPACITY (C) =
[INTERNAL HEAT LOAD (A) – HEAT TRANSFER (B)] ÷ ΔT

Internal heat load (A) is determined using the "Component Power – Component Efficiency" method on page 12. In this example, the estimated heat load is as follows:

Total System Power = 5000 Watts
Less Efficiency = 5000 x (1 - .85)
Internal Heat Load = 750 Watts

Heat transfer (B) is derived using the equation method, since this is an outdoor application. For brevity, we will assume the English system (°F, inches and feet).

$q = (To_o - Ti_i) \div [(1/ho_o) + (1/hi_i) + R]$

"q" is heat transfer per surface area. For an explanation of the other variables on page 14.

q = (104 - 114) ÷ [(1/6) + (1/2) + 4]

q = -2.14 Watts per sq. ft.

Total Heat Transfer: 2.14 x 72 Sq. Ft. = 154 Watt
(negative sign is ignored)

ΔT is 10 F — the difference between ambient temperature and the rated temperature of the electronics.

HEAT EXCHANGER CAPACITY (C) =
[750 WATTS (A) – 154 WATTS (B)] ÷ 10 F

HEAT EXCHANGER CAPACITY (C) = 60 Watts/°F

As in the Indoor Industrial example, the above result is **minimum** heat exchanger capacity. If no heat exchanger model is similar to the result, choose the next largest size to ensure adequate electronics cooling.

Power input, protection level and dimensions of the heat exchanger also need to fit the system.

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Notes

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SPECTRACOOL™
Indoor & Outdoor Air Conditioners

G52 Indoor Model

G57 Outdoor Model

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Makes electronics cooling easier, so you can go about your business

SPECTRACOOL™ Indoor & Outdoor Air Conditioners

PRODUCT OVERVIEW

An energy-efficient rotary compressor and new earth-friendly refrigerant provide reliable cooling in rugged indoor and outdoor environments. All models are built with corrosion-resistant components and are Telcordia GR-487 capable.

APPLICATIONS

- Industrial automation
- Telecommunications equipment
- Wastewater treatment systems
- Package handling equipment
- Security and defense systems

SPECTRACOOL Chapter Contents

Indoor and Outdoor Base Models 20
G52 Models 8000/12000 BTU/Hr. 21
G57 Models 20000 BTU/Hr. 28

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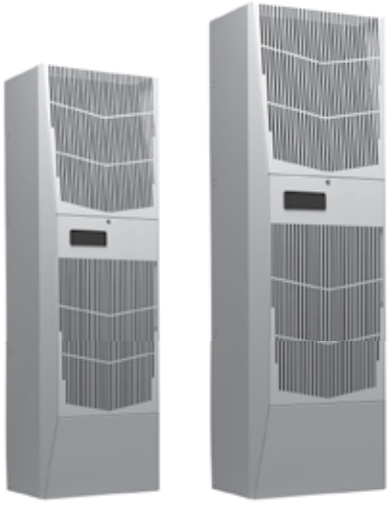
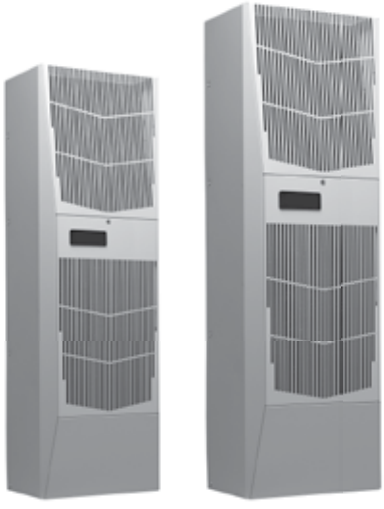
Indoor and Outdoor Base Models



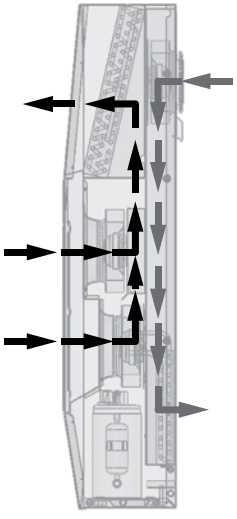
G52 Indoor Model
8000 & 12000 BTU/Hr.
2300 & 3500 Watts

G57 Indoor Model
20000 BTU/Hr.
5900 Watts



G52 Outdoor Model
8000 & 12000 BTU/Hr.
2300 & 3500 Watts

G57 Outdoor Model
20000 BTU/Hr.
5900 Watts



Clean Air Flow
Ambient Air Flow

Industry Standards

UL/cUL Listed Type 12, 3R, 4

CE
IP 56 Internal Loop
IP 34 on External Loop
Telcordia GR-487 capable (Outdoor)

Application

- Industrial automation
- Telecommunications equipment
- Waste water treatment systems
- Package handling equipment
- Security and defense systems
- And more

Features

- Energy efficient rotary compressor
- R134a earth-friendly refrigerant and RoHS compliant
- Models for 115, 230 and 400/460 3-phase AC volt power input
- UL Listed to save customers time and money with agency approvals
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C
- Exterior and partial recessed mounting options
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat on enclosure side of the unit. Indoor Air Conditioner models include digital display on ambient side.
- Dual condenser-side air movers for performance redundancy
- Galvanized sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cut-out adapter options for enclosures with McLean GENESIS® and T-Series air conditioners, enabling users to easily transition to the new unit
- Cleanable, reusable aluminum mesh filter to protect coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Indoor Air Conditioner models also include:
  - Active condensate management with heater strip
  - Power-off relay for door switch and other system requirements
  - Malfunction switch
- Standard Outdoor Air Conditioner models also include:
  - Telcordia GR-487 capable
  - Corrosion-resistant components
  - Malfunction switch
  - Compressor heater
  - Head pressure control
  - 2000 Watt enclosure heater

Specifications

- Nominal cooling capacity 8000 & 12000 BTUs/Hr. (2300 and 3500 Watts)
- R134a earth-friendly refrigerant and RoHS compliant
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C

Finish

- RAL 7035 light-gray powder-coat paint in a semi-texture finish
- Other colors and textures available

Notes

Visit www.McLeanCoolingTech.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

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SPECTRACOOL™

Performance Data **G52 Models 8000/12000 BTU/Hr. (2300/3500 Watt)**

MODEL NUMBER						
Indoor	G52-0816-G050	G52-0826-G050	G52-0846-G050	G52-1216-G050	G52-1226-G050	G52-1246-G050
Outdoor	G52-0816-G150	G52-0826-G150	G52-0846-G150	G52-1216-G150	G52-1226-G150	G52-1246-G150
COOLING PERFORMANCE						
Nominal:						
BTUs/Hr.	**8000**	**8000**	**8000**	**12000**	**12000**	**12000**
Watts	**2300**	**2300**	**2300**	**3500**	**3500**	**3500**
At 131 F / 131 F (55 C / 55 C):						
BTUs/Hr.	7300/8200	7300/8200	8800/9800	12000/12500	12000/12500	11100/12000
Watts	2139/2403	2139/2403	2578/2871	3516/3662	3516/3662	3252/3516
At 95 F / 95 F (35 C / 35 C):						
BTUs/Hr.	6000/6800	6000/6800	7400/8200	9900/10700	9900/10700	9900/10700
Watts	1758/1992	1758/1992	2168/2402	2900/3135	2900/3135	2900/3135
Refrigerant	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant Charge (ounces/grams)	24/680	24/680	24/680	38/1077	38/1077	38/1077
Operating Temperature Range:						
Maximum (°F/°C)	131/55	131/55	131/55	131/55	131/55	131/55
Indoor Minimum (°F/°C)	50/10	50/10	50/10	50/10	50/10	50/10
Outdoor Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:						
Internal loop 50 Hz (CFM/M^3/Hr.)	285/484	285/484	285/484	287/487	287/487	287/487
External loop 50 Hz (CFM/M^3/Hr.)	650/1104	650/1104	650/1104	635/1078	635/1078	635/1078
Internal loop 60 Hz (CFM/M^3/Hr.)	310/527	310/527	310/527	305/518	305/518	305/518
External loop 60 Hz (CFM/M^3/Hr.)	700/1189	700/1189	700/1189	650/1104	650/1104	650/1104
Max. Heater Watts (Outdoor Models):	2000	2000	NA	2000	2000	NA
ELECTRICAL DATA						
Rated Voltage	**115**	**230/208-230**	**400/460 3~**	**115**	**230/208-230**	**400/460 3~**
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts)	1250/1415	1250/1415	806/957*	2100/2427	1830/2130	910/1106*
Max. Nominal Current (Amps)	11.2/12.3	5.6/7.0-6.2	3.1/3.2	16.1/21.0	9.1/10.6-9.5	3.5/3.7
Starting Current (Amps)	48	27	16	57	38	16
Agency Approvals	cUL Listed CE Others available upon request					
Power Input Description	IEC plug with 10-ft./3-m cord	IEC plug with 10-ft./3-m cord	Terminal block	IEC plug with 10-ft./3-m cord	IEC plug with 10-ft./3-m cord	Terminal block
ENCLOSURE PROTECTION						
UL Type	Type 12/3R/4 standard 4X stainless steel optional					
International Rating	IP56 Internal Loop IP34 External Loop					
CONTROLLER						
Description	Basic mechanical thermostat with digital display					
Thermostat Location	Enclosure side on all base models					
Digital Display Location:						
Indoor Models	Ambient side					
Outdoor Models	Enclosure side					
Factory Thermostat Setting (F/C)	80/27					
SOUND LEVEL						
At 1.5 Meters	68dBA					
UNIT CONSTRUCTION						
Material	Galvanized sheet metal standard Stainless steel optional					
Finish	Powder coat RAL 7035 light gray semi-textured standard Other colors available					
ACCESSORIES						
Cleanable Re-Usable Filter	Aluminum mesh Part #10-1000-103					
Indoor Cut-Out Adapter	Enables SPECTRACOOL to be mounted to a GENESIS M52 air conditioner cut-out Part #52-6216-01					
Outdoor Cut-Out Adapter	Enables SPECTRACOOL to be mounted to a T-Series T50 air conditioner cut-out Part #52-6216-03					
UNIT DIMENSIONS						
Height (in./mm)	52.69/1338					
Width (in./mm)	17.12/435					
Depth (in./mm)	11.66/296					
Weight (lb./kg)	128/58.1	128/58.1	138/62.6	131/59.4	131/59.4	141/64.0

*Watts based on .65 power factor.

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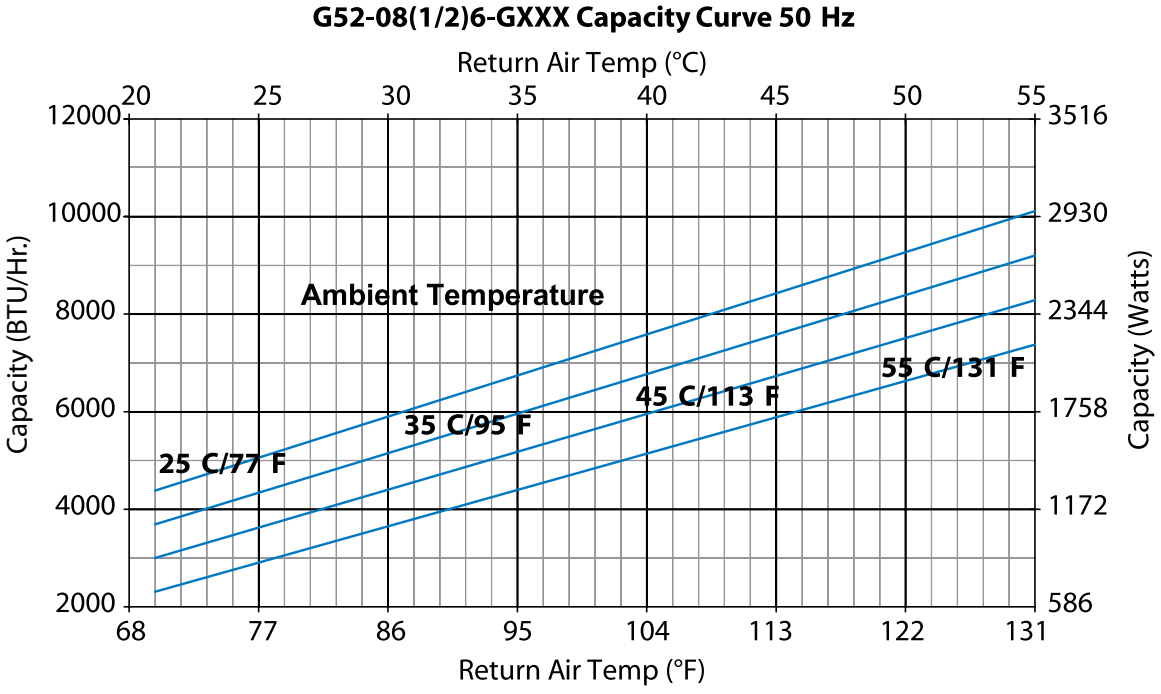
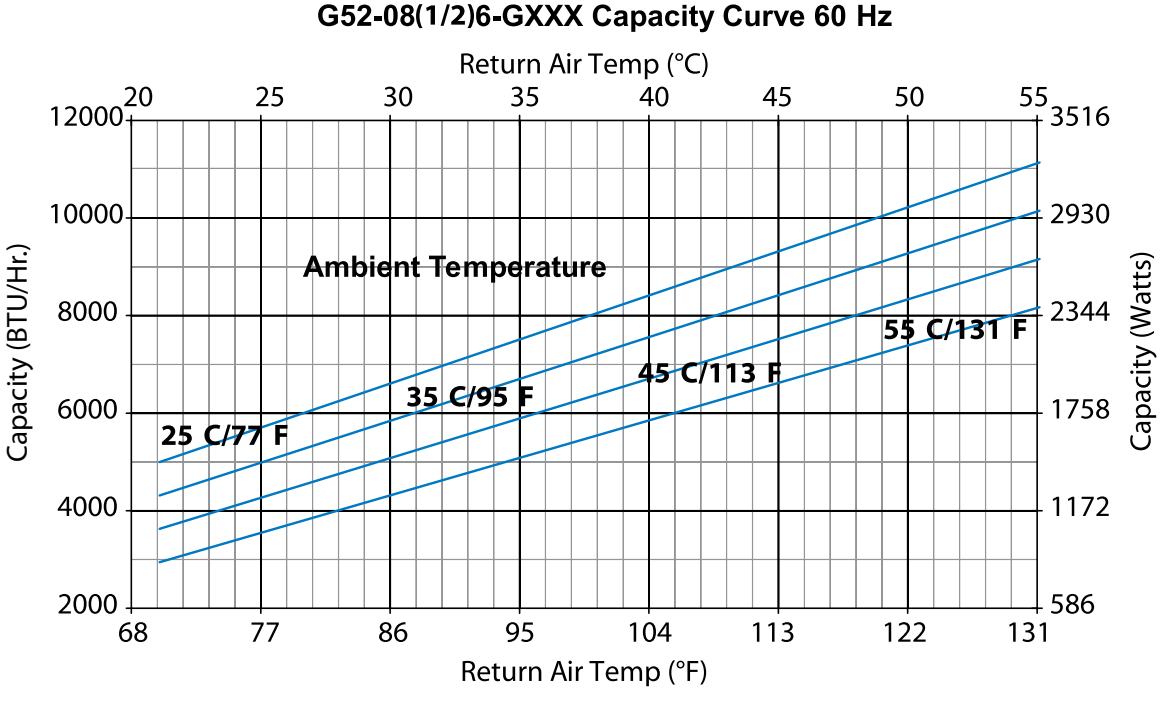
Performance Curves for G52 Models 8000 BTU/Hr. (2300 Watt)





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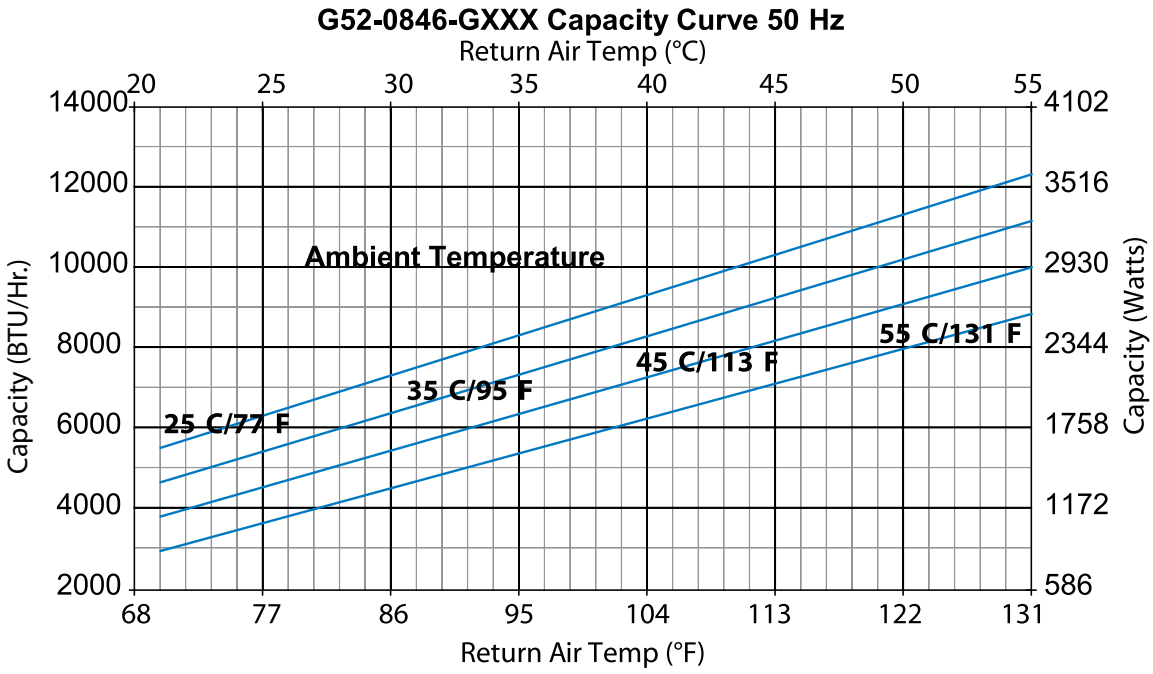
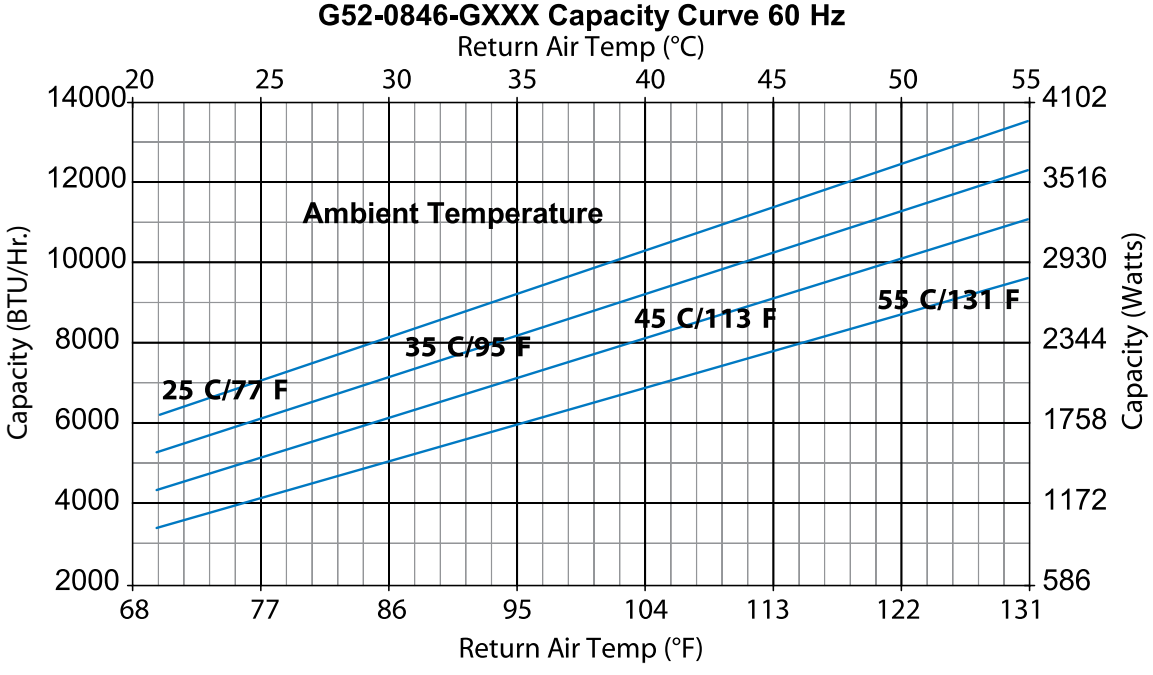
Performance Curves for G52 Models 8000 BTU/Hr. (2300 Watt)





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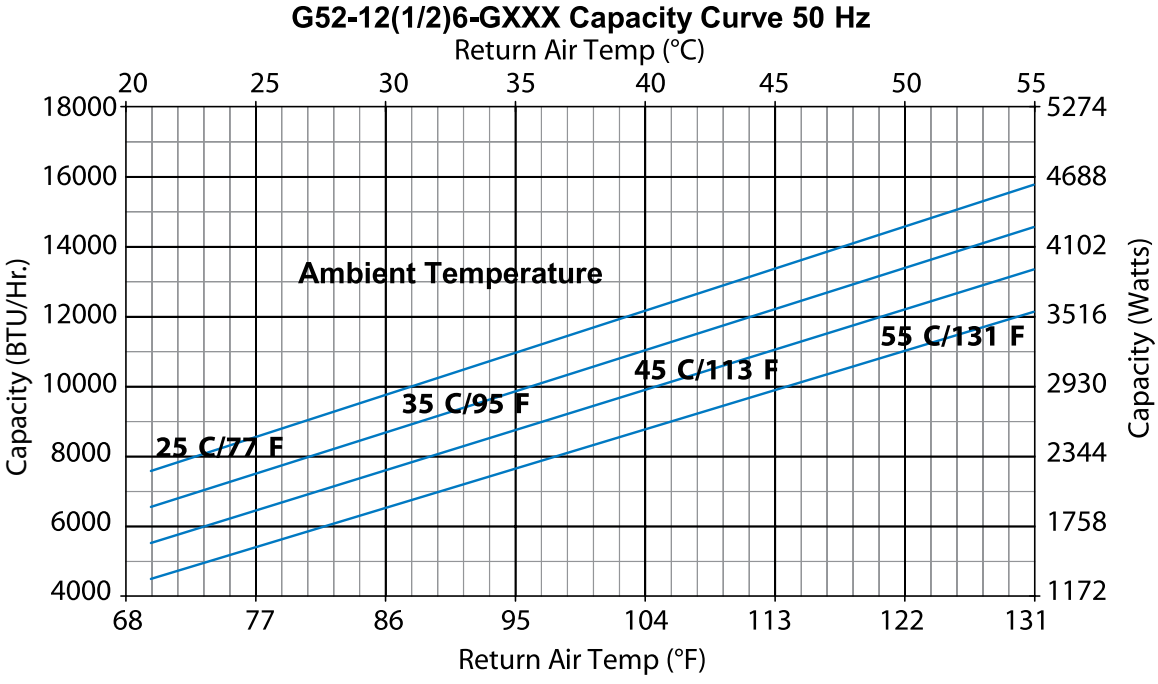
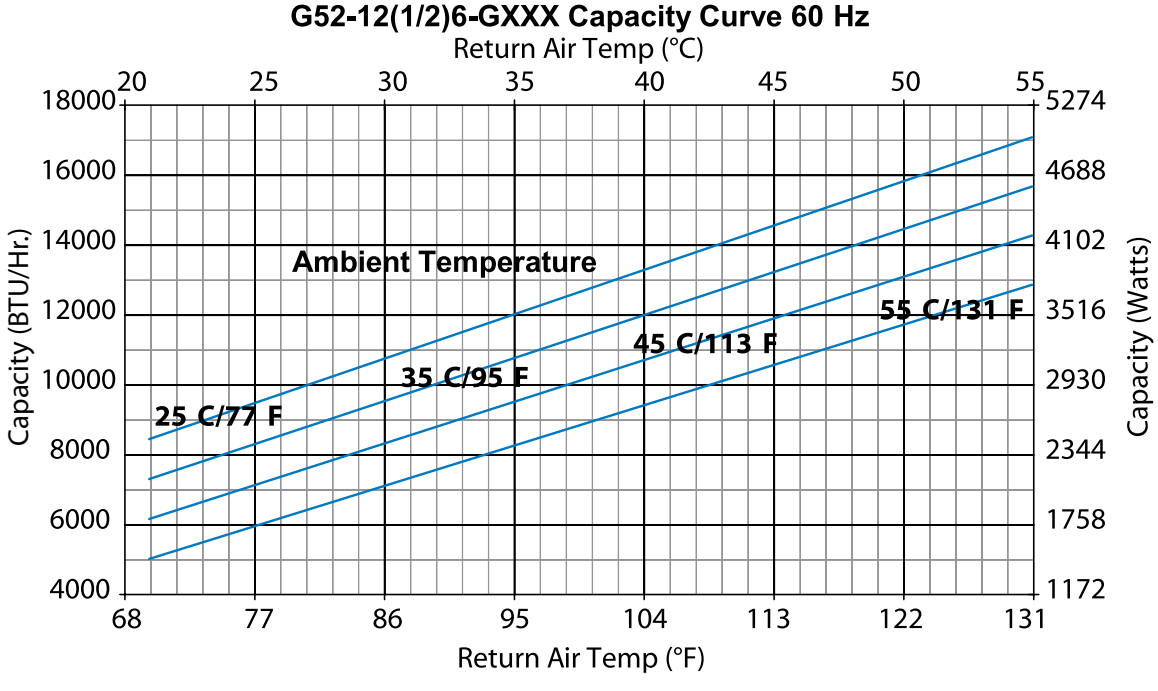
Performance Curves for G52 Models 12000 BTU/Hr. (3500 Watt)





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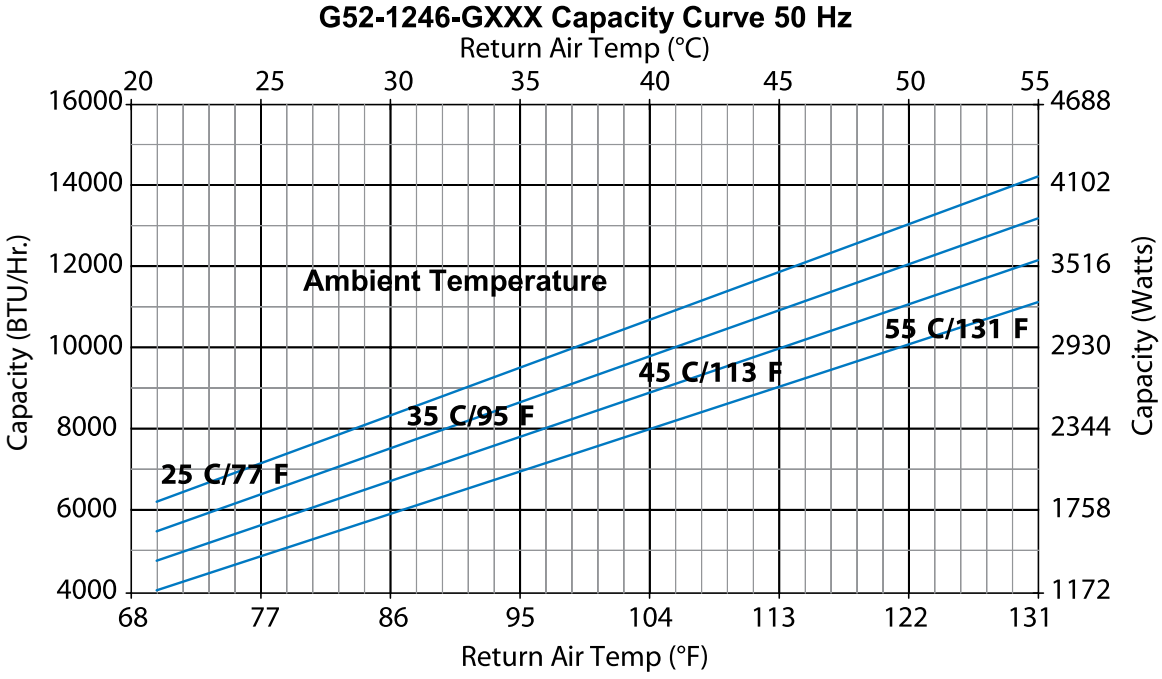
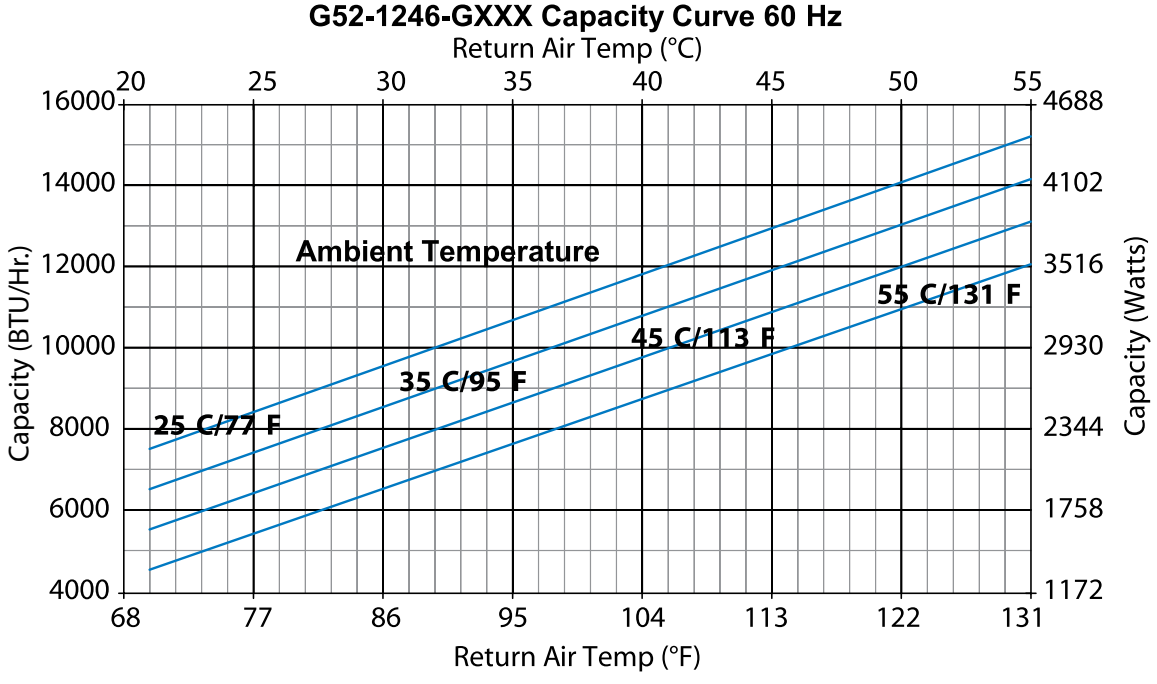
Performance Curves for G52 Models 12000 BTU/Hr. (3500 Watt)





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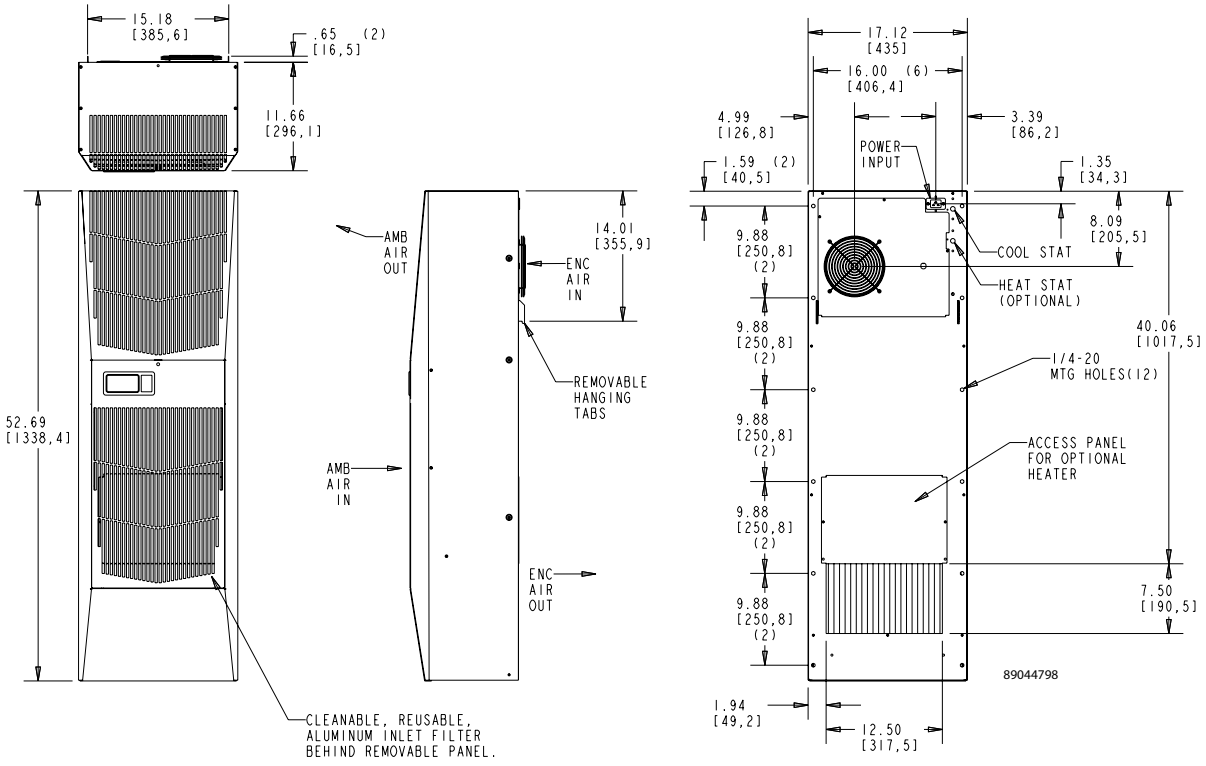
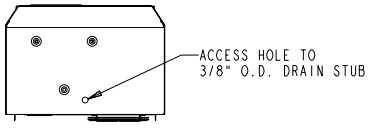
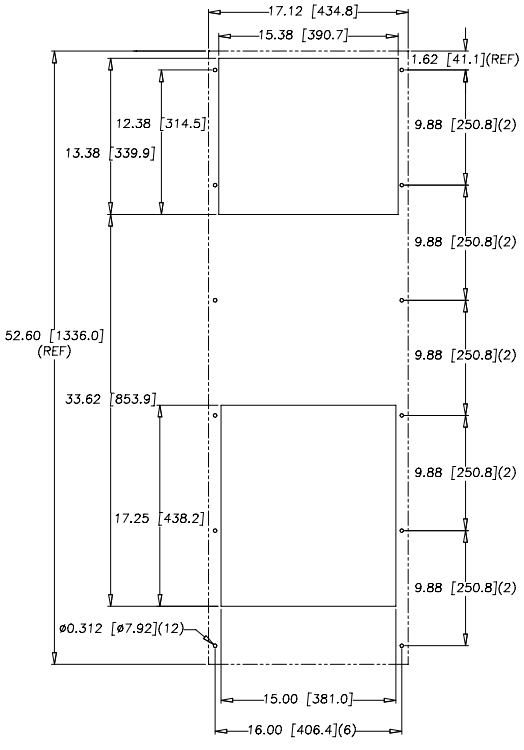
G52 Models 8000/12000 BTU/Hr. (2300/3500 Watt)







CUTOUT INSTRUCTIONS

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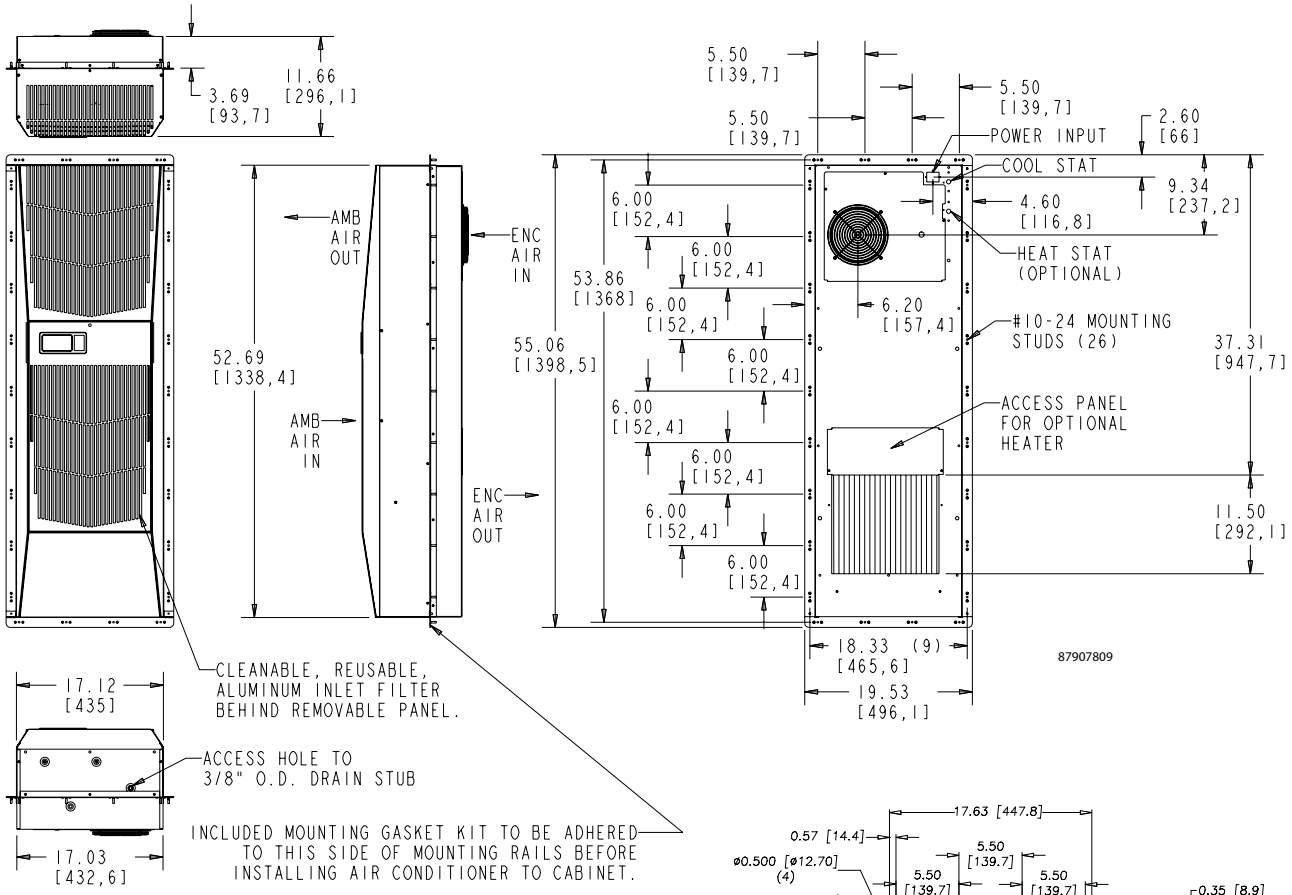
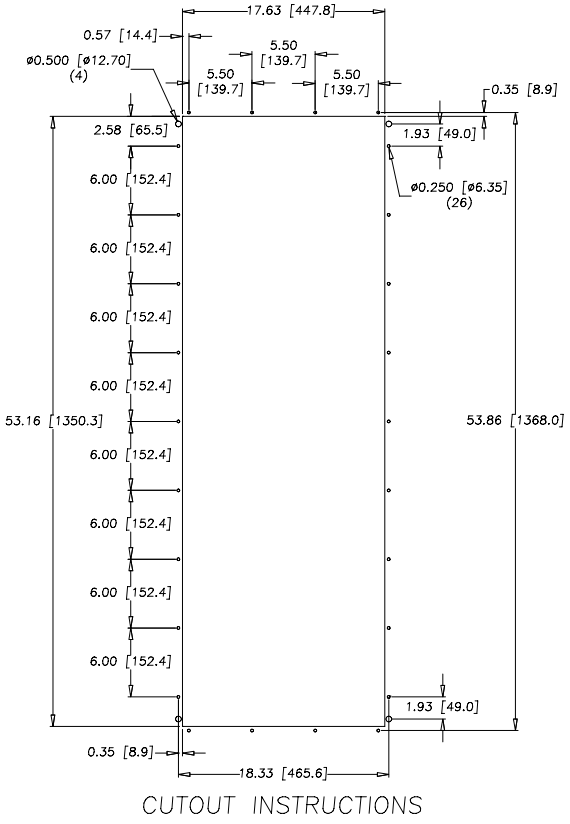
G52 Models 8000/12000 BTU/Hr. (2300/3500 Watt) With Partial Recess





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SPECTRACOOL™

Performance Data **G57 Models 20000 BTU/Hr. (5861 Watt)**

MODEL NUMBER		
Indoor	G57-2026-G050	G57-2046-G050
Outdoor	G57-2026-G150	G57-2046-G150
COOLING PERFORMANCE		
Nominal:		
BTUs/Hr.	**20000**	**20000**
Watts	**5861**	**5861**
At 131 F/131 F (55 C/55 C):		
BTUs/Hr. (50/60 Hz)	17500/19600	21400/23400
Watts (50/60 Hz)	5129/5744	6272/6857
At 95 F/95 F (35 C/35 C):		
BTUs/Hr. (50/60 Hz)	16000/18000	19300/21400
Watts (50/60 Hz)	4689/5275	5656/6272
Refrigerant	R407c	R407c
Refrigerant Charge (ounces/grams)	50/1417	48/1361
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Indoor Minimum (°F/°C)	50/10	50/10
Outdoor Minimum (°F/°C)	-40/-40	-40/-40
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	513/872	513/872
External loop 50 Hz (CFM/M^3/Hr.)	919/1562	919/1562
Internal loop 60 Hz (CFM/M^3/Hr.)	587/998	587/998
External loop 60 Hz (CFM/M^3/Hr.)	1055/1794	1055/1794
Max. Heater Watts (Outdoor Models)	3000	NA
ELECTRICAL DATA		
Rated Voltage	**230/230**	**400/460 3~**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	2900/3319	1560/2033*
Max. Nominal Current (Amps at 50/60 Hz)	19.6/22.2	6.0/6.8
Starting Current (Amps)	63	27
Agency Approvals	cUL Listed CE Others available upon request	
Power Input Description	IEC plug with 10-ft./3-m cord	Terminal Block
ENCLOSURE PROTECTION		
UL Type	Type 12, 3R, 4 Standard 4X Stainless Steel Optional	
International Rating	IP56 Internal Loop IP34 External Loop	
CONTROLLER		
Description	Basic Mechanical Thermostat with Digital Display	
Thermostat Location	Enclosure Side on All Base Models	
Digital Display Location:		
Indoor Models	Ambient Side	
Outdoor Models	Enclosure Side	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 m	74.1	
UNIT CONSTRUCTION		
Material	Galvanized Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat RAL 7035 Light Gray Semi-Textured Standard	
ACCESSORIES		
Cleanable Re-Usable Filter	Aluminum Mesh Part #10-1000-103 BA	
Outdoor Model Cut-Out Adapter	Enables SPECTRACOOL to be mounted to a T-Series T53 air conditioner cut-out Part #57-7216-01	
UNIT DIMENSIONS		
Height (in./mm)	57.69/1465.4	
Width (in./mm)	20.78/527.8	
Depth (in./mm)	15.29/388.3	
Weight (lb./kg)	197/89	197/89

* Watts based on .65 power factor

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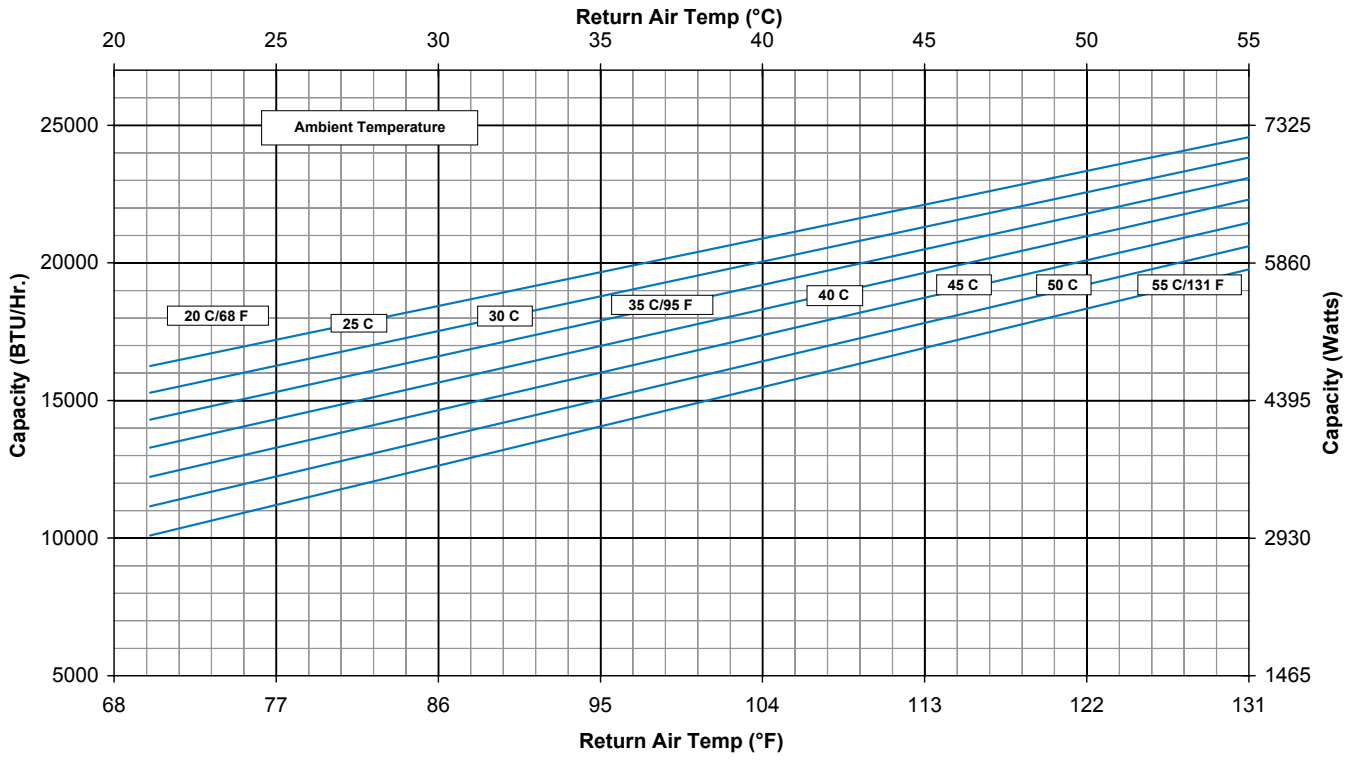
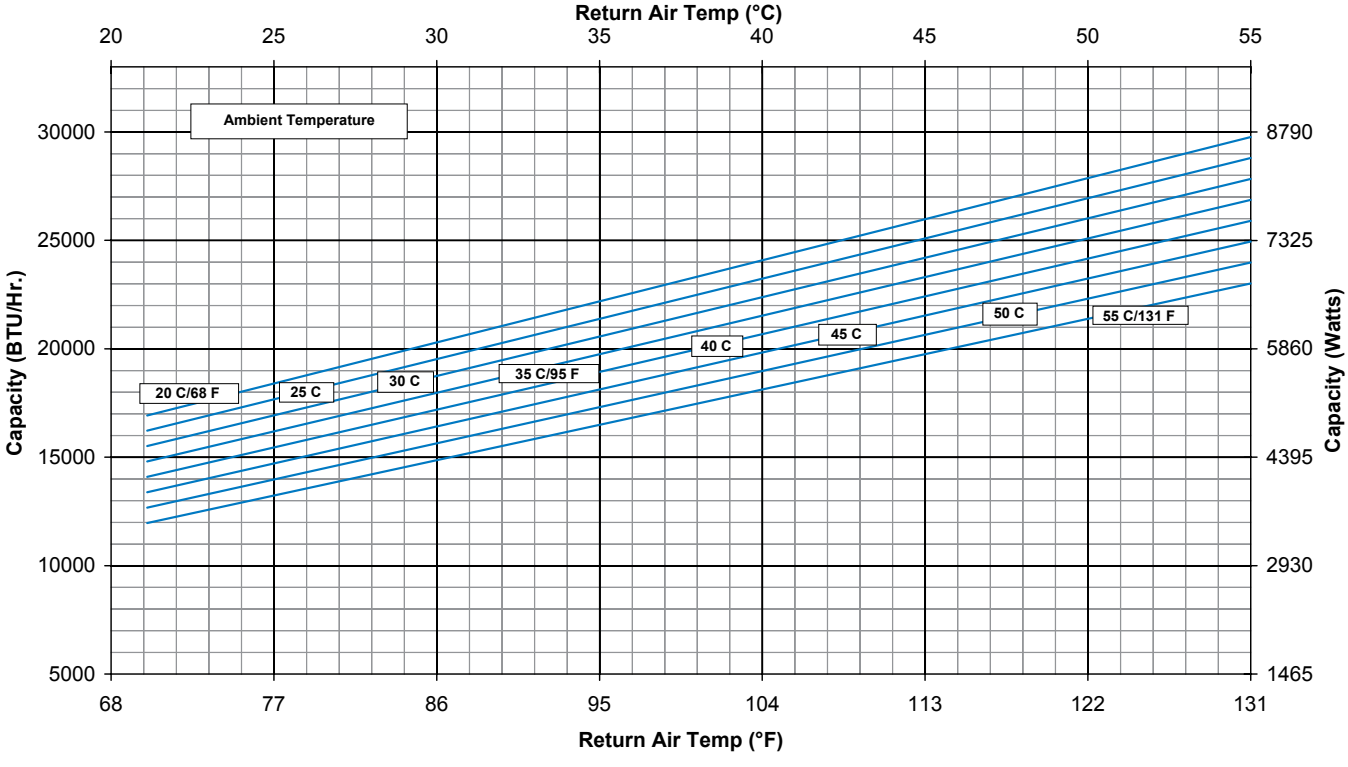
Performance Curves for G57 Models 20000 BTU/Hr.

G57-2026-GXXX Capacity Curve 50 Hz



G57-2026-GXXX Capacity Curve 60 Hz



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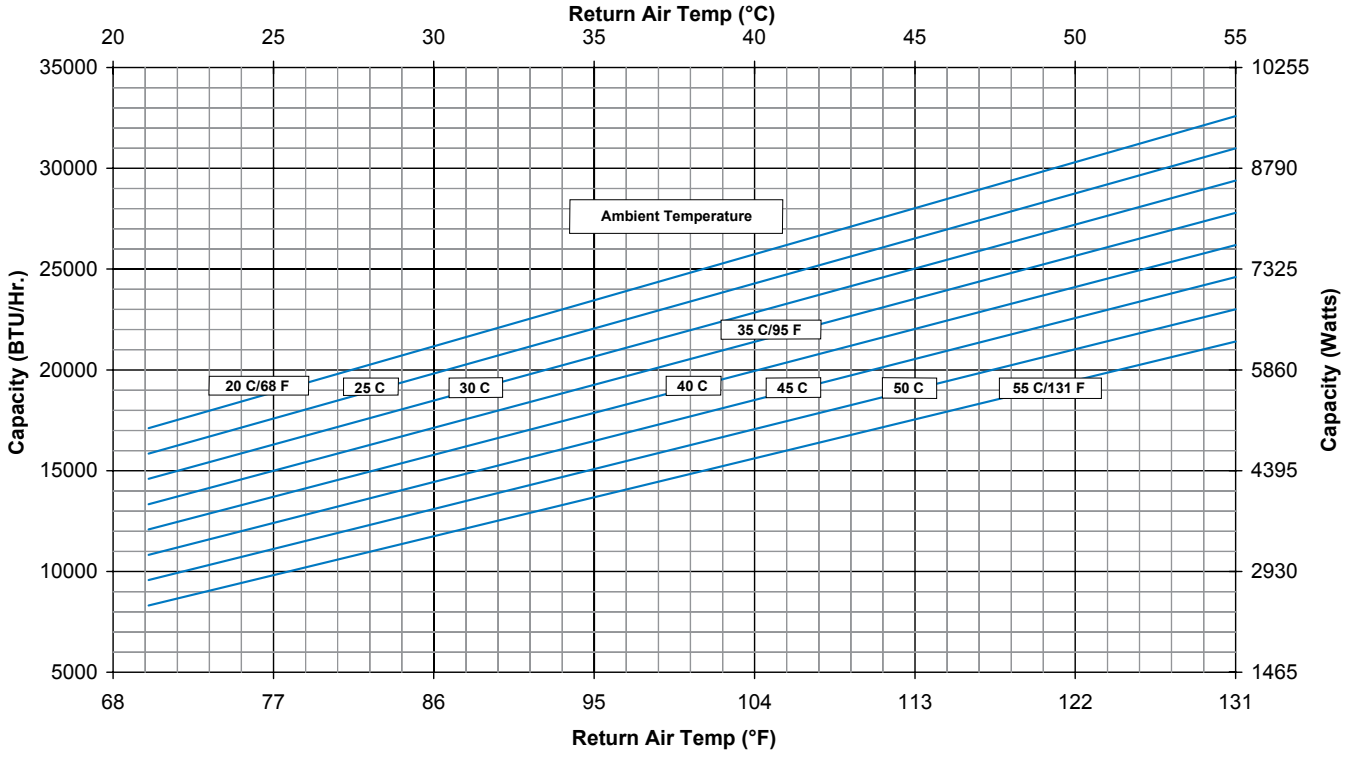
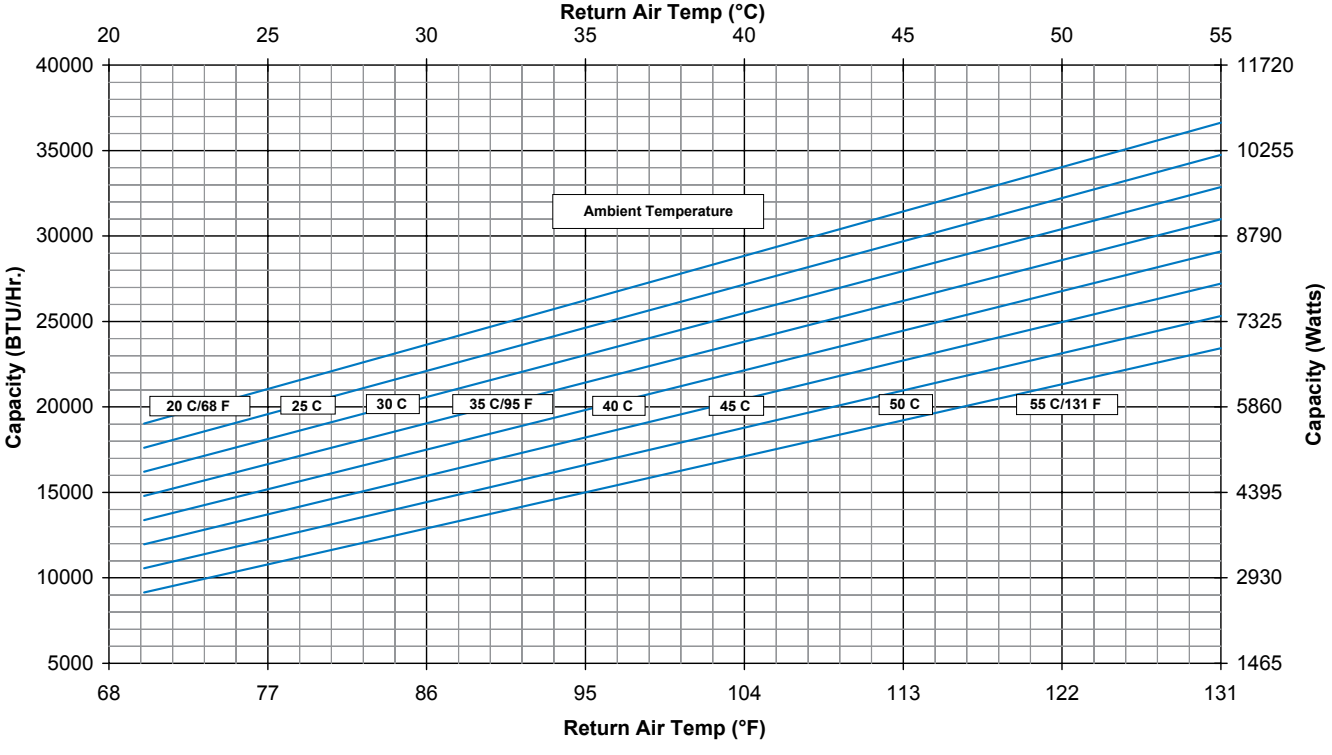
Performance Curves for G57 Models 20000 BTU/Hr.

G57-2046-GXXX Capacity Curve 50 Hz



G57-2046-GXXX Capacity Curve 60 Hz



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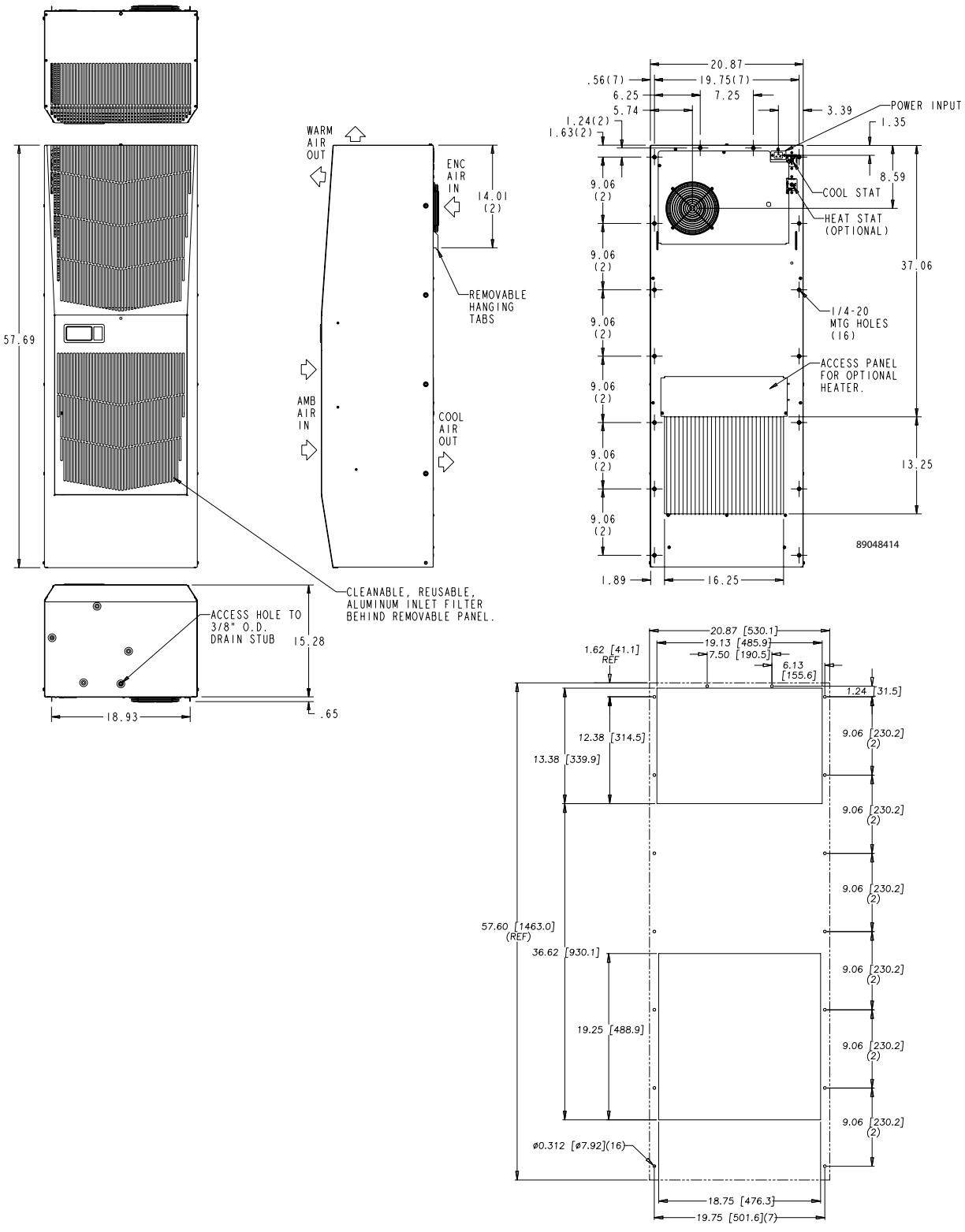
G57 Models 20000 BTU/Hr. (5861 Watt)



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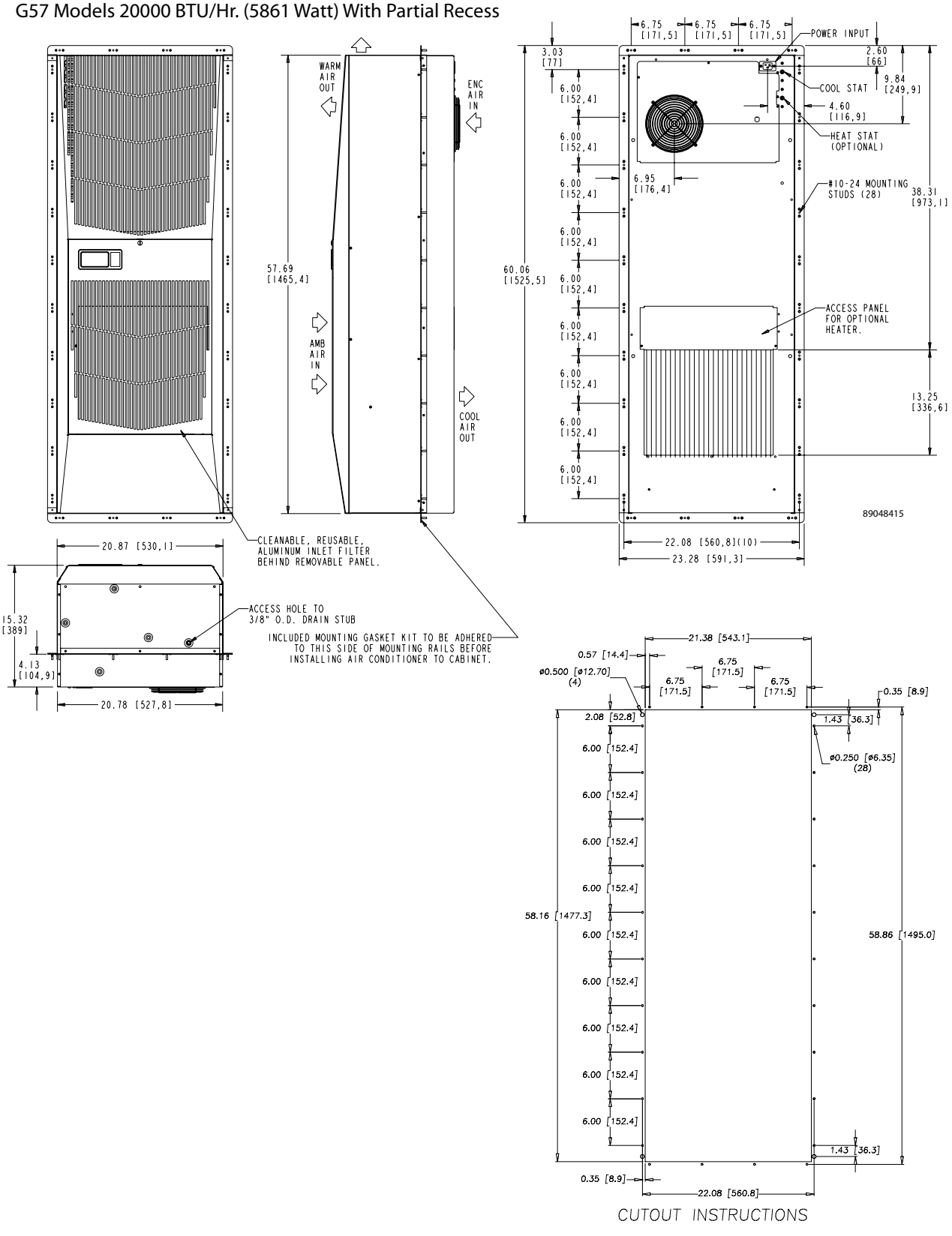
G57 Models 20000 BTU/Hr. (5861 Watt) With Partial Recess



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Notes

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T-Series
Indoor/Outdoor Air Conditioners

T29 Model

T53 Model

T70 Model (3 ton)

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Keeps its cool during peak heat loads and hot weather

T-Series Indoor/Outdoor Air Conditioners

PRODUCT OVERVIEW

The perfect cooling system where precise temperature control is needed. Built rugged to perform in extremely hot and cold ambient temperatures. Engineered to seal out virtually any bad weather.

APPLICATIONS

- Telecommunications cabinets and shelters
- Transportation controls
- Outdoor security systems
- Mobile communications systems
- Other outdoor electronics applications

T-Series Chapter Contents

Indoor/Outdoor Air Conditioners.....36
T15 Model.....37
T20 Model.....40
T29 Model.....43
T43 6000 BTU Model.....46
T43 8000 BTU Model.....48
T43 10000 BTU Model.....50
T50 Model.....53
T53 Model.....56
T62 Model.....59
T70-36 Model.....62
T70-60 Model.....65

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Indoor/Outdoor Air Conditioners

T15
800 BTU/Hr.
234 Watts

T20
2000 BTU/Hr.
586 Watts

T29
4000 BTU/Hr.
1173 Watts

T43
6000, 8000, 10000 BTU/Hr.
1758, 2344, 2930 Watts

T50
12000 BTU/Hr.
3516 Watts

T53
19000 BTU/Hr.
5567 Watts

T62
20000 BTU/Hr.
5860 Watts

T70-36
36000 BTU/Hr.
10548 Watts

T70-60
59000 BTU/Hr.
17287 Watts

Industry Standards

UL/cUL Listed, CE, others available upon request

- Type 12/3R/4
- Type 4X stainless steel option
- Telcordia GR-487 capable

Application

- Industrial automation
- Telecommunications equipment
- Package handling equipment
- Security and defense systems
- And more

Features

- Stock models equipped with head pressure control for low-ambient operation, compressor heater, coated condenser coil, malfunction switch, thermostat and heater package
- R134A or R-407C earth-friendly refrigerant and RoHS compliant
- Models for 115, 230 and 460 Volt AC power input
- UL Listed to save customers time and money with agency approvals (some models UL recognized)
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C
- Exterior and fully recessed mounting options on many models
- Compact footprint to minimize real estate and maximize capacity
- Reliable mechanical thermostat on enclosure side of the unit
- Dual condenser-side air movers for performance redundancy
- Painted galvanized sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cleanable, reusable aluminum mesh filter to protect coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Outdoor Air Conditioner models also include:
  - Telcordia GR-487 capable
  - Thermostat
  - Corrosion-resistant components
  - Malfunction switch
  - Compressor heater
  - Head pressure control
  - Enclosure heater

Finish

- RAL 7035 light-gray powder-coat paint finish
- Other colors and textures available

Options

- Thermostat Malfunction Package
- Special Voltage Package
- Outdoor Package
- Harsh Environment Package*
- Stainless Steel Package*
- Heater Package

* PROAIR A/C may be more appropriate. Refer to PROAIR A/C chapter. Consult the factory for availability and catalog number.

Notes

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T-Series

Performance Data **T15 Models 800 BTU/Hr. (234 Watt)**

MODEL NUMBER		
	T15-0116-G150	T15-0126-G150
COOLING PERFORMANCE		
Nominal:		
BTUs/Hr.	**800/800**	**800/900**
Watts	**235/235**	**235/264**
At 131 F/131 F (55 C/55 C):		
BTUs/Hr. (50/60 Hz)	819	920/960
Watts (50/60 Hz)	240	270/281
At 95 F/95 F (35 C/35 C):		
BTUs/Hr. (50 /60 Hz)	948	810/955
Watts (50/60 Hz)	278	237/280
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	4/113	3.8/107
Operating Temperature Range:		
Maximum (ºF/ºC)	131/55	125/131/52/55
Minimum (ºF/ºC)	-40/-40	-40/-40
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	25/42	25/42
External loop 50 Hz (CFM/M^3/Hr.)	48/82	48/82
Internal loop 60 Hz (CFM/M^3/Hr.)	30/51	30/51
External loop 60 Hz (CFM/M^3/Hr.)	53/90	53/90
Max. Heater Watts (Outdoor Models)	150	150
ELECTRICAL DATA		
Rated Voltage	**100/115**	**220/230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	360/403	330/345
Max. Nominal Current (Amps at 50/60 Hz)	3.6/3.5	1.5/1.5
Starting Current (Amps)	8.0/9.2	3.3/3.1
Agency Approvals	cUL Listed CE Others available upon request	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional	
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Enclosure Behind Front Panel	
Factory Thermostat Setting (ºF/ºC)	80/27	
SOUND LEVEL		
At 1.5 Meters	63 dBA	
UNIT CONSTRUCTION		
Material	Galvanized Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	15.75/400	
Width (in./mm)	7.5/191	
Depth (in./mm)	6.3/160	
Weight (lb./kg)	27/12	

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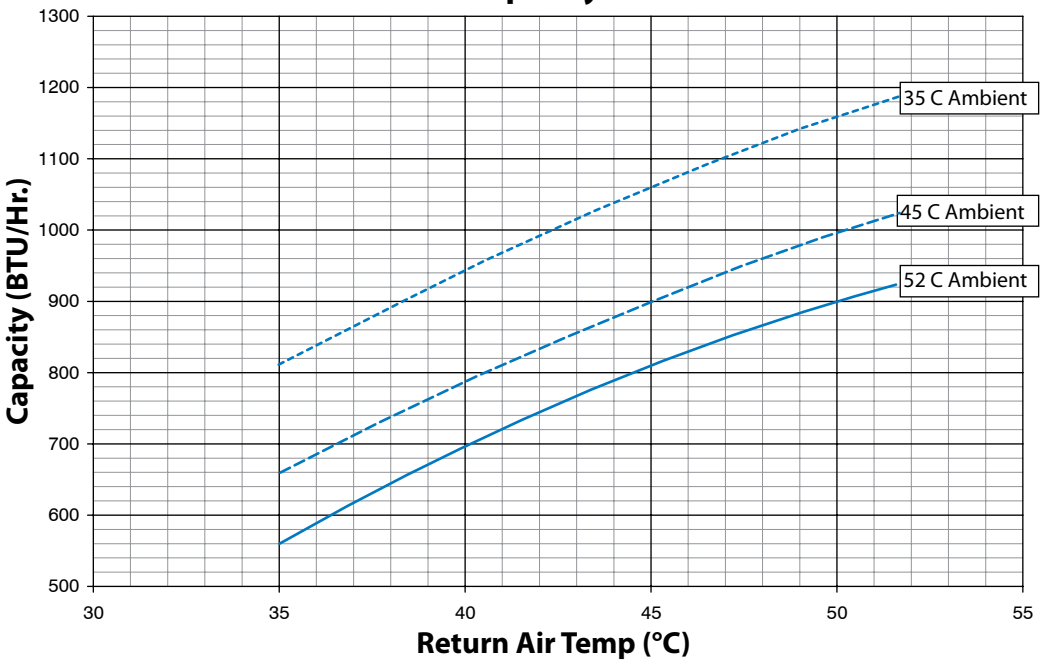
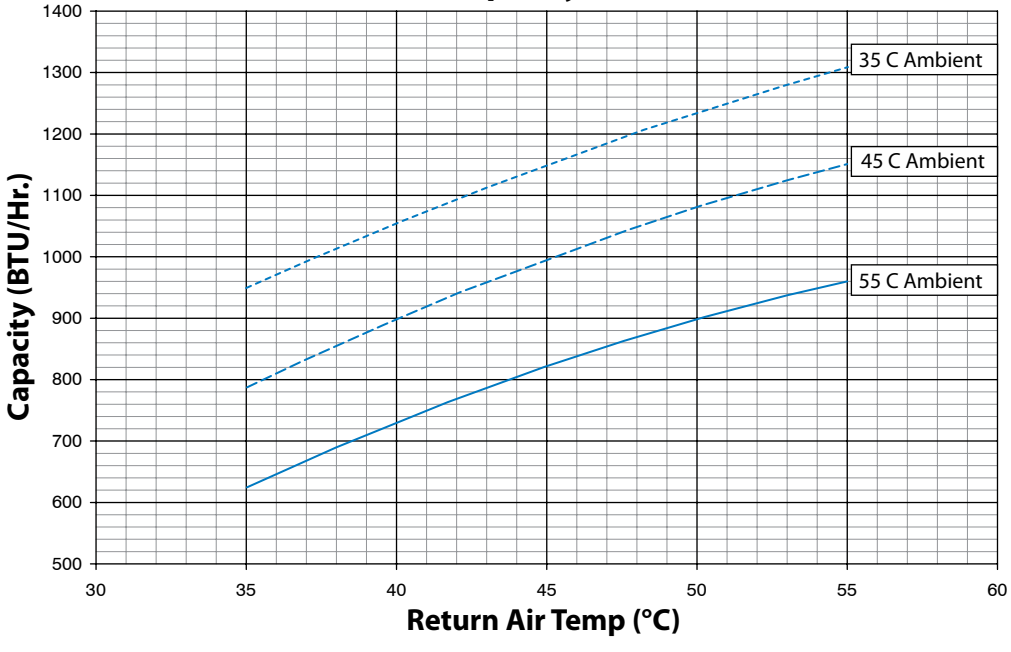
Performance Curves for T15 Models 800 BTU/Hr. (234 Watt)

T15-01x6-Gxxx Capacity Curves 50 Hz



T15-01x6-Gxxx Capacity Curves 60 Hz



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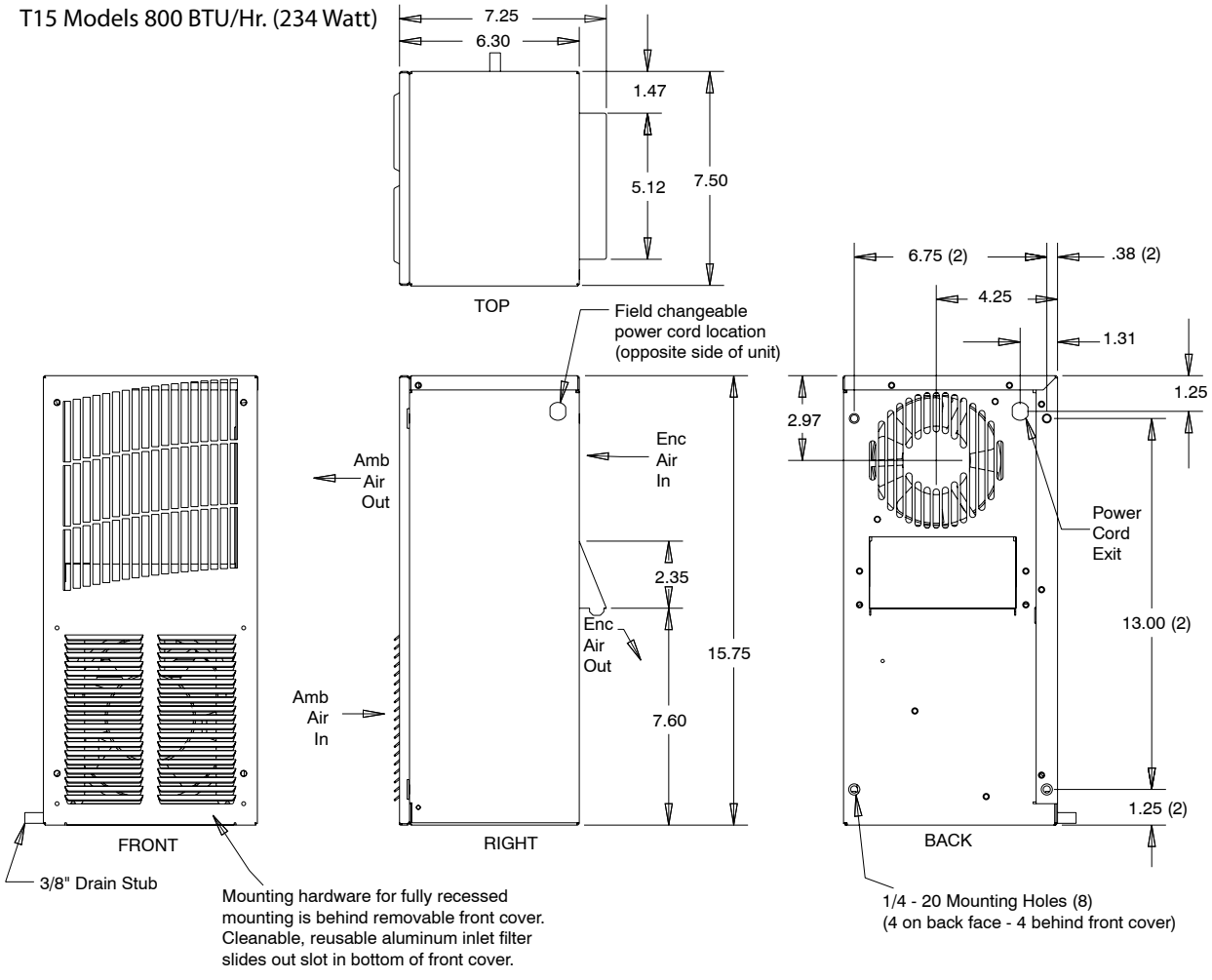
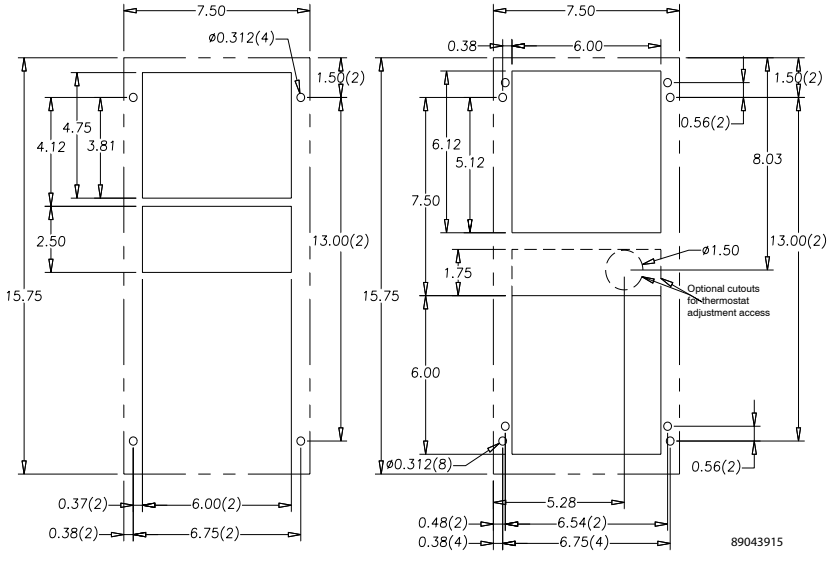
T-Series

T15 Models 800 BTU/Hr. (234 Watt)





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T-Series

Performance Data **T20 Models 2000 BTU/Hr. (586 Watt)**

MODEL NUMBER	T20-0216-G150	T20-0226-G150	T20-0246-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**1800/2000**	**1800/2000**	**1800/2000**
Watts	**528/586**	**528/586**	**528/586**
At 131 F/131 F (49 C/49 C):			
BTUs/Hr. (50/60 Hz)	2000/2175	2000/2175	2000/2175
Watts (50/60 Hz)	586/637	586/637	586/637
At 95 F/95 F (35 C/35 C):			
BTUs/Hr. (50/60 Hz)	1950/2200	1950/2200	1950/2200
Watts (50/60 Hz)	571/645	571/645	571/645
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	6.7/190	6.7/190	6.7/190
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	77/131	77/131	77/131
External loop 50 Hz (CFM/M^3/Hr.)	150/255	150/255	150/255
Internal loop 60 Hz (CFM/M^3/Hr.)	91/155	91/155	91/155
External loop 60 Hz (CFM/M^3/Hr.)	165/280	165/280	165/280
Max. Heater Watts (Outdoor Models)	500	500	500
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	805	805	874
Max. Nominal Current (Amps at 50/60 Hz)	7.0/7.0	3.5/3.5	1.9
Starting Current (Amps)	28	14.4	7.2
Agency Approvals	cUL Listed CE Others available upon request		cUR CE
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Enclosure Side on All Base Models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	66 dBA		
UNIT CONSTRUCTION			
Material	Galvanized Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat ANSI 70 Light Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	20/508	20/508	24.25/615.95
Width (in./mm)	10/254	10/254	10/254
Depth (in./mm)	9.9/251	9.9/251	9.9/251
Weight (lb./kg)	56/25	56/25	66/30

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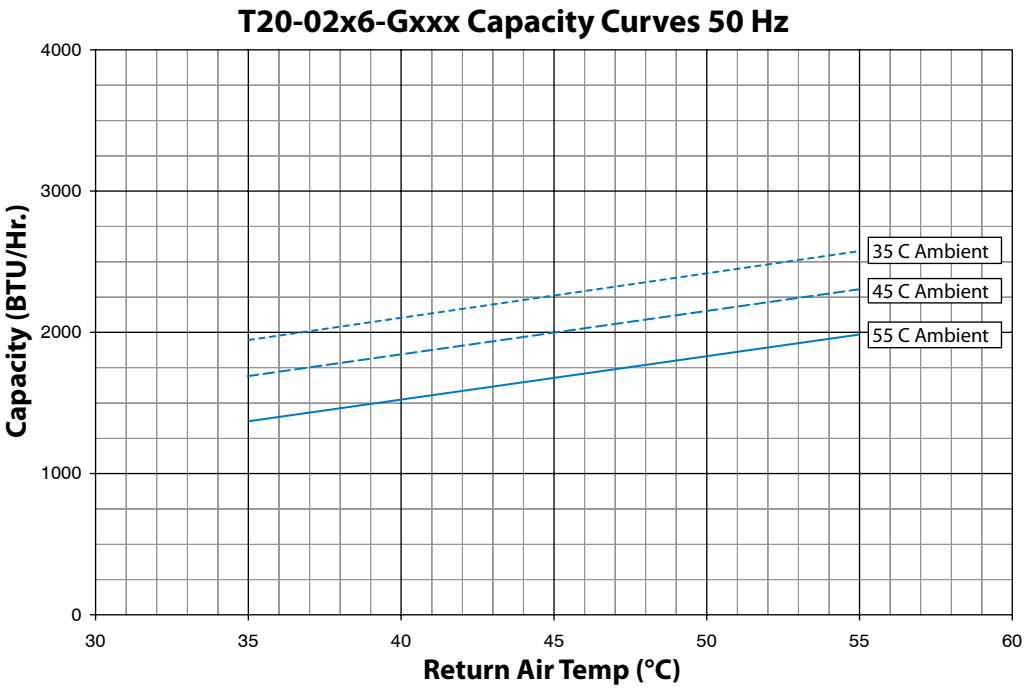
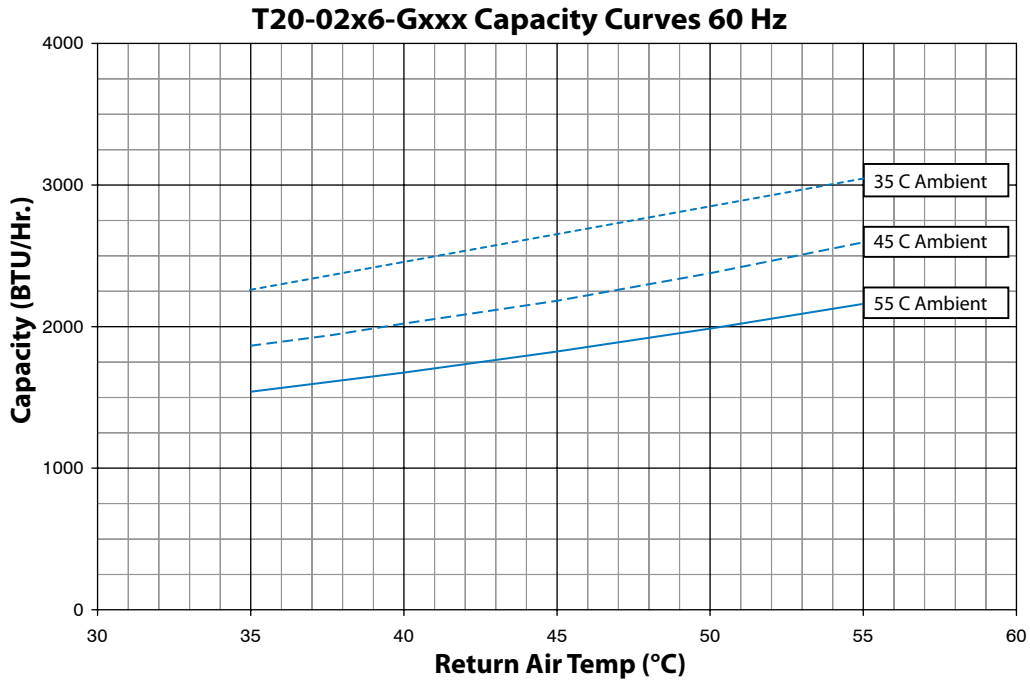
Performance Curves for T20 Models 2000 BTU/Hr. (586 Watt)





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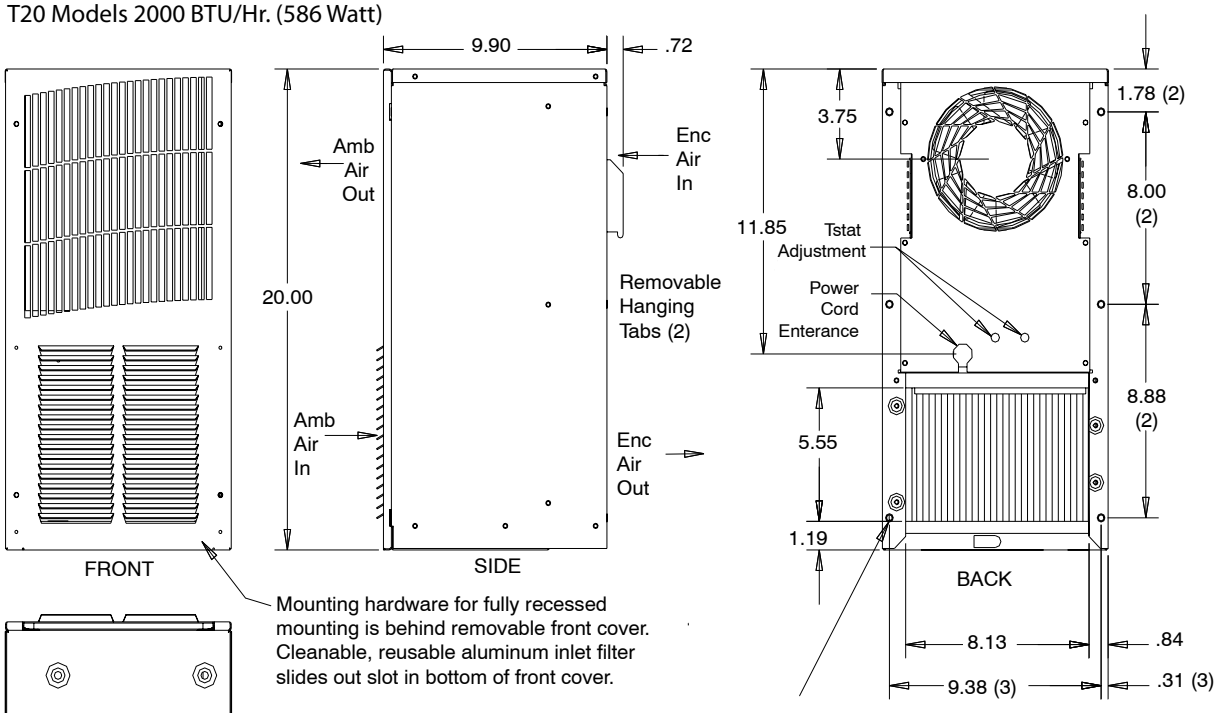
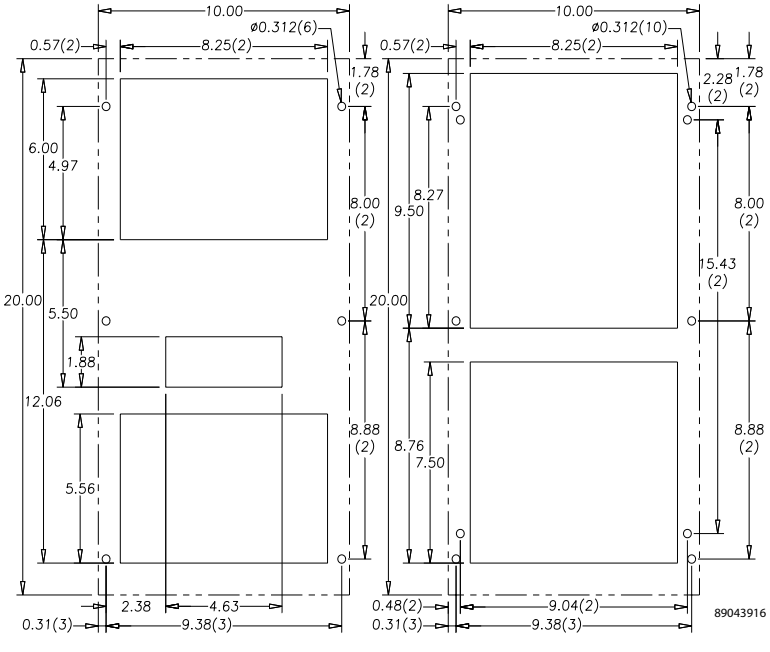
T-Series

T20 Models 2000 BTU/Hr. (586 Watt)





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CUTOUT INSTRUCTIONS

(As viewed from outside of enclosure)

NOTES:
1. Dashed lines represent air conditioner.

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Performance Data **T29 Models 4000 BTU/Hr. (1173 Watt)**

MODEL NUMBER			
	T29-0416-G150	T29-0426-G150	T29-0446-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**3600/4000**	**3600/4000**	**3600/4000**
Watts	**1055/1172**	**1055/1172**	**1055/1172**
At 131 F/131 F (55 C/55 C):			
BTUs/Hr. (50/60 Hz)	3950/4250	3950/4250	3950/4250
Watts (50/60 Hz)	1157/1245	1157/1245	1157/1245
At 95 F/95 F (35 C/35 C):			
BTUs/Hr. (50 /60 Hz)	3500/3900	3500/3900	3500/3900
Watts (50/60 Hz)	1025/1143	1025/1143	1025/1143
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	14.3/404	14.3/404	14.3/404
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	172/292	172/292	172/292
External loop 50 Hz (CFM/M^3/Hr.)	195/331	195/331	195/331
Internal loop 60 Hz (CFM/M^3/Hr.)	205/348	205/348	205/348
External loop 60 Hz (CFM/M^3/Hr.)	235/399	235/399	235/399
Max. Heater Watts (Outdoor Models)	1000	1000	
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1587/1564	1587/1564	1748
Max. Nominal Current (Amps at 50/60 Hz)	13.8/13.6	6.9/6.8	3.8
Starting Current (Amps)	48	23	12
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Enclosure Side on All Base Models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 M	67 dBA		
UNIT CONSTRUCTION			
Material	Galvanized Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat ANSI 70 Light Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	29/737	29/737	29/737
Width (in./mm)	17/432	17/432	17/432
Depth (in./mm)	11.3/287	11.3/287	11.3/287
Weight (lb./kg)	107/48.6	107/48.6	127/58

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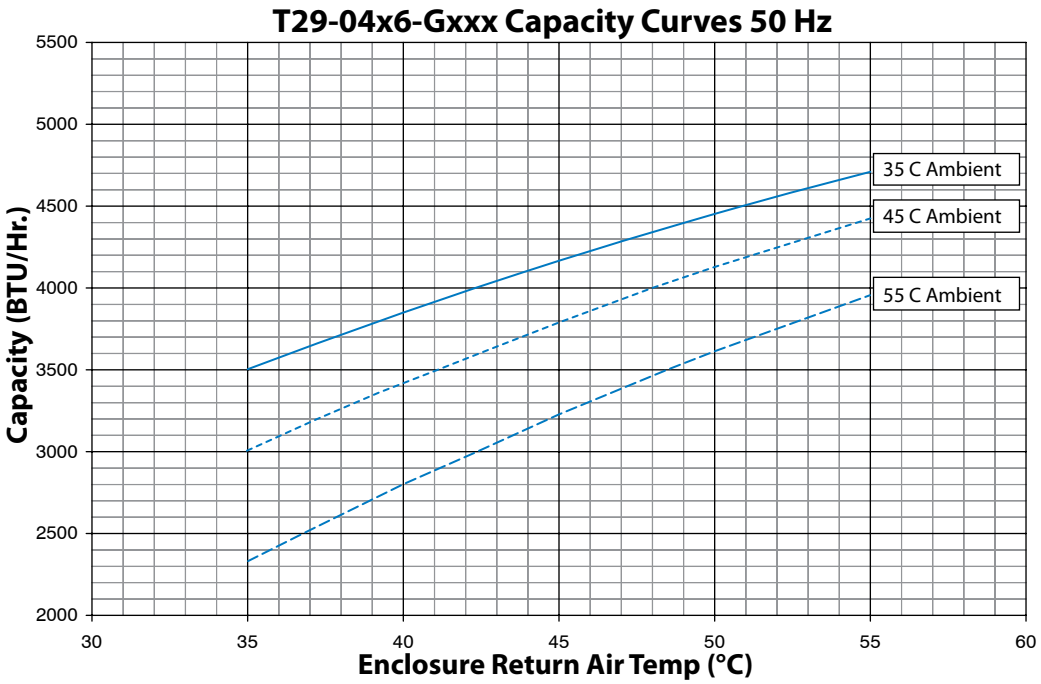
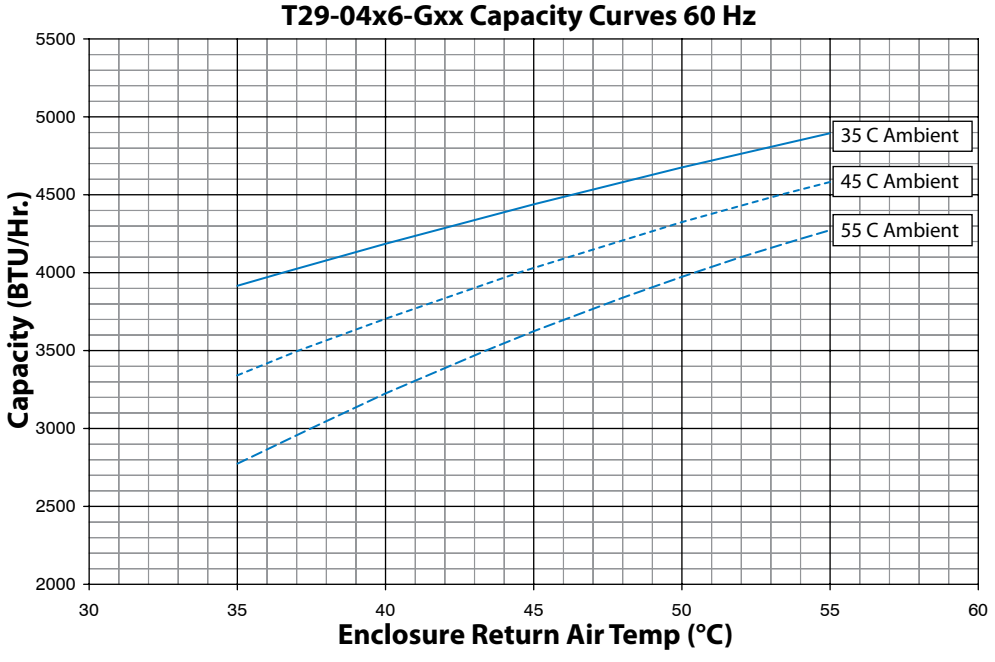
Performance Curves for T29 Models 4000 BTU/Hr. (1173 Watt)





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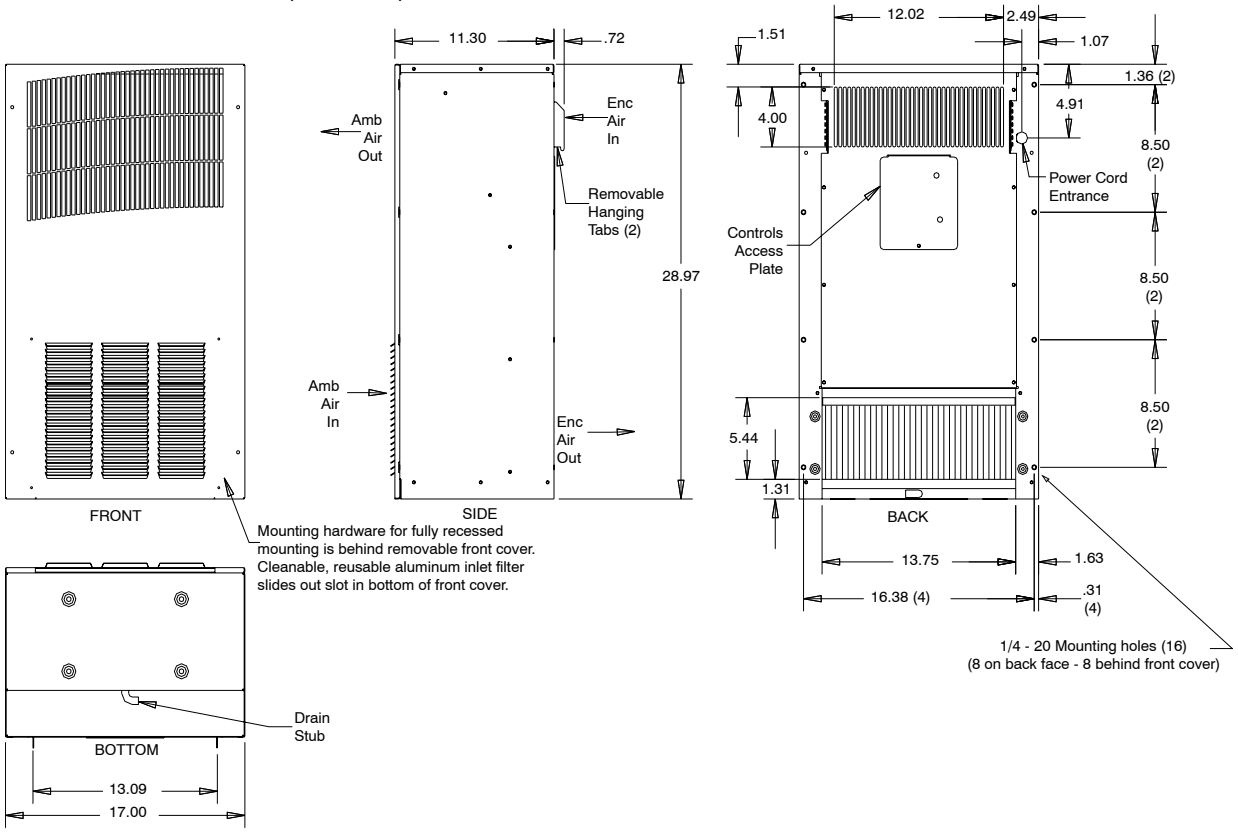
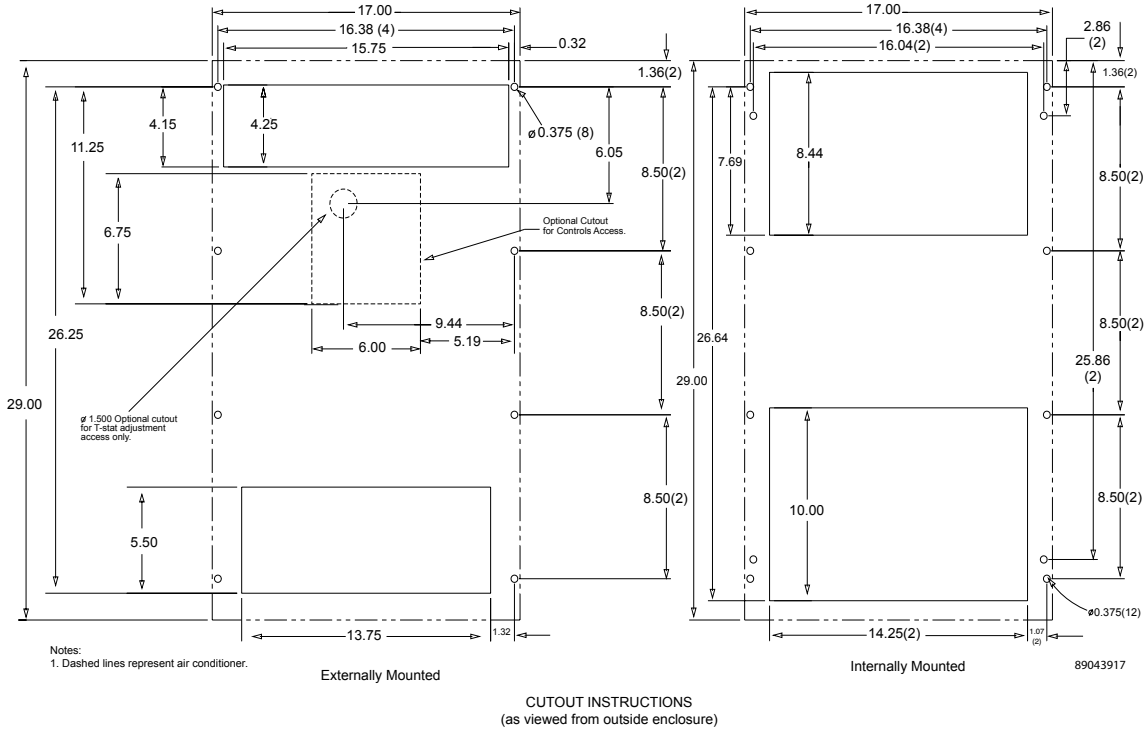
T-Series

T29 Models 4000 BTU/Hr. (1173 Watt)





CUTOUT INSTRUCTIONS
(as viewed from outside enclosure)

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T-Series

Performance Data **T43 Models 6000 BTU/Hr. (1758 Watt)**

MODEL NUMBER	T43-0616-G150	T43-0626-G150	T43-0646-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**6310/6680**	**6520/6770**	**6520/6770**
Watts	**1848/1958**	**1910/1985**	**1910/1985**
At 131 F/131 F (55 C/55 C):			
BTUs/Hr. (50/60 Hz)	6400/6680	6520/6774	6520/6774
Watts (50/60 Hz)	1875/1957	1910/1985	1910/1985
At 95 F/95 F (35 C/35 C):			
BTUs/Hr. (50 /60 Hz)	5500/5900	5461/5846	5461/5846
Watts (50/60 Hz)	1611/1729	1600/1713	1600/1713
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	30/850	30/850	30/850
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	310/527	310/527	310/527
External loop 50 Hz (CFM/M^3/Hr.)	345/586	345/586	345/586
Internal loop 60 Hz (CFM/M^3/Hr.)	320/544	320/544	320/544
External loop 60 Hz (CFM/M^3/Hr.)	355/603	355/603	355/603
Max. Heater Watts (Outdoor Models)	1000	1000	N/A
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1058/989	1012/874	1104/966
Max. Nominal Current (Amps at 50/60 Hz)	9.2/8.6	4.4/3.8	2.4/2.1
Starting Current (Amps)	57.2	27	14
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional		
International Rating	IP56 on the internal loop; IP34 on the external loop		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Enclosure Side on All Base Models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 M	65.7 dBA		
UNIT CONSTRUCTION			
Material	Galvanized Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat ANSI 70 Light Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	43/1092		
Width (in./mm)	15.75/400		
Depth (in./mm)	10.9/279		
Weight (lb./kg)	125/57		

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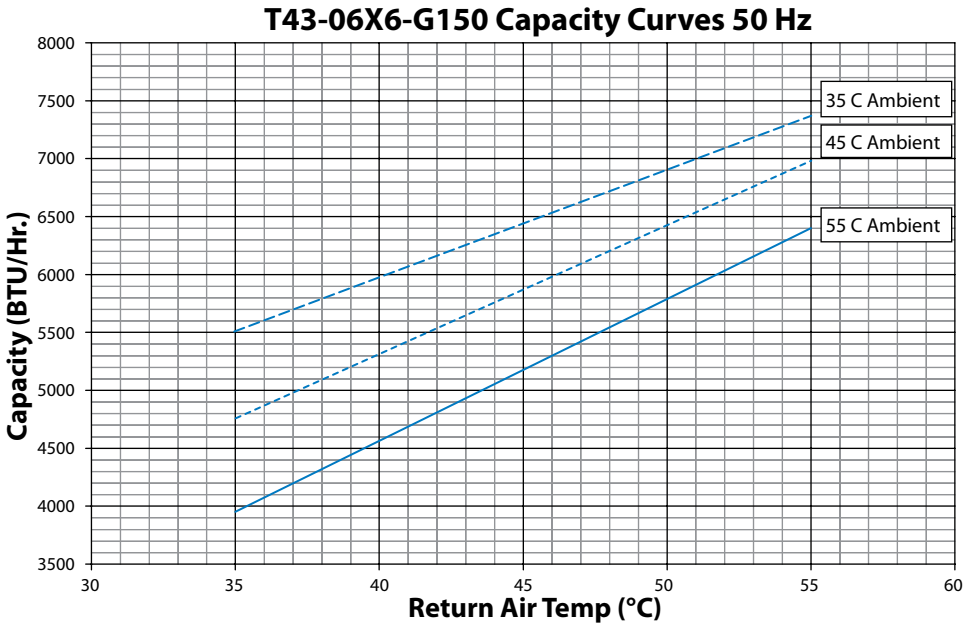
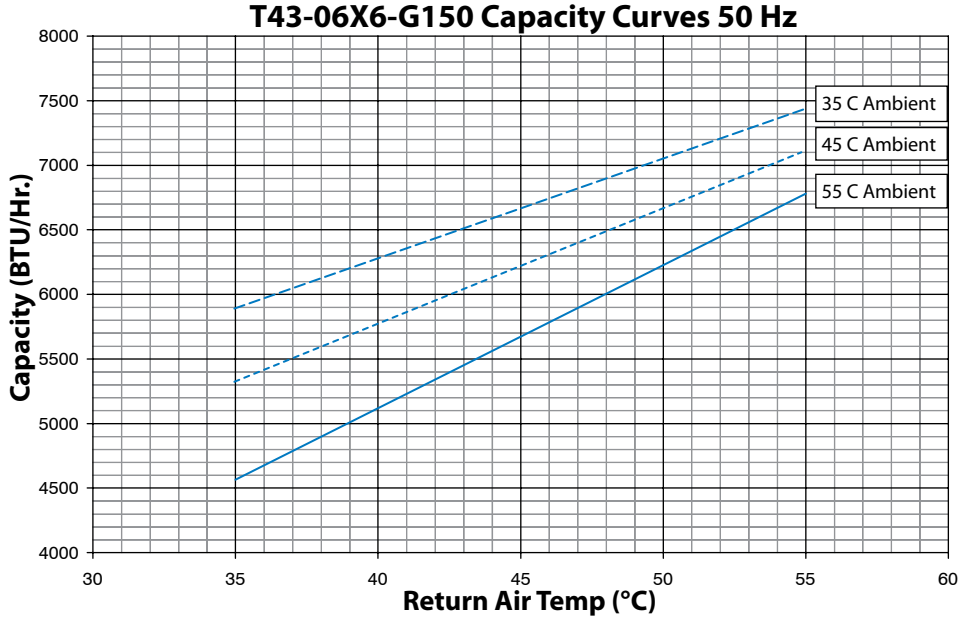
Performance Curves for T43 Models 6000 BTU/Hr. (1758 Watt)





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T-Series

Performance Data **T43 Models 8000 BTU/Hr. (2344 Watt)**

MODEL NUMBER	T43-0816-G150	T43-0826-G150	T43-0846-G150
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**7900/8600**	**7400/8200**	**7400/8200**
Watts	**2310/2500**	**2160/2400**	**2160/2400**
At 131 F/131 F (55 C/55 C):			
BTUs/Hr. (50/60 Hz)	7937/8629	7484/8215	7484/8215
Watts (50/60 Hz)	2326/2528	2193/2407	2193/2407
At 95 F/95 F (35 C/35 C):			
BTUs/Hr. (50 /60 Hz)	6401/7100	5940/6705	5940/6705
Watts (50/60 Hz)	1875/2080	1740/1965	1740/1965
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	36/1022	36/1022	36/1022
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	273/464	273/464	273/464
External loop 50 Hz (CFM/M^3/Hr.)	310/527	310/527	310/527
Internal loop 60 Hz (CFM/M^3/Hr.)	290/493	290/493	290/493
External loop 60 Hz (CFM/M^3/Hr.)	315/535	315/535	315/535
Max. Heater Watts (Outdoor Models)	1000	1000	N/A
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1196/1288	1196/1242	1334/1380
Max. Nominal Current (Amps at 50/60 Hz)	10.4/11.2	5.2/5.4	2.9/3.0
Starting Current (Amps)	48.3	27	14
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6 ft. cord	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional		
International Rating	IP56 on the internal loop; IP34 on the external loop		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Enclosure Side on All Base Models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 M	65.7 dBA		
UNIT CONSTRUCTION			
Material	Galvanized Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat ANSI 70 Light Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	43/1092		
Width (in./mm)	15.75/400		
Depth (in./mm)	10.9/279		
Weight (lb./kg)	125/57		

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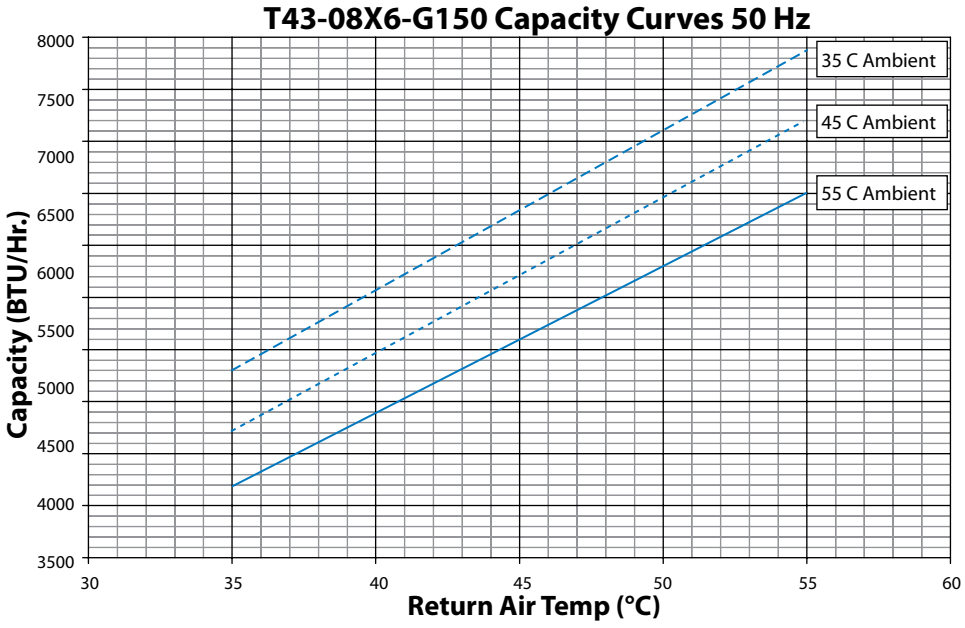
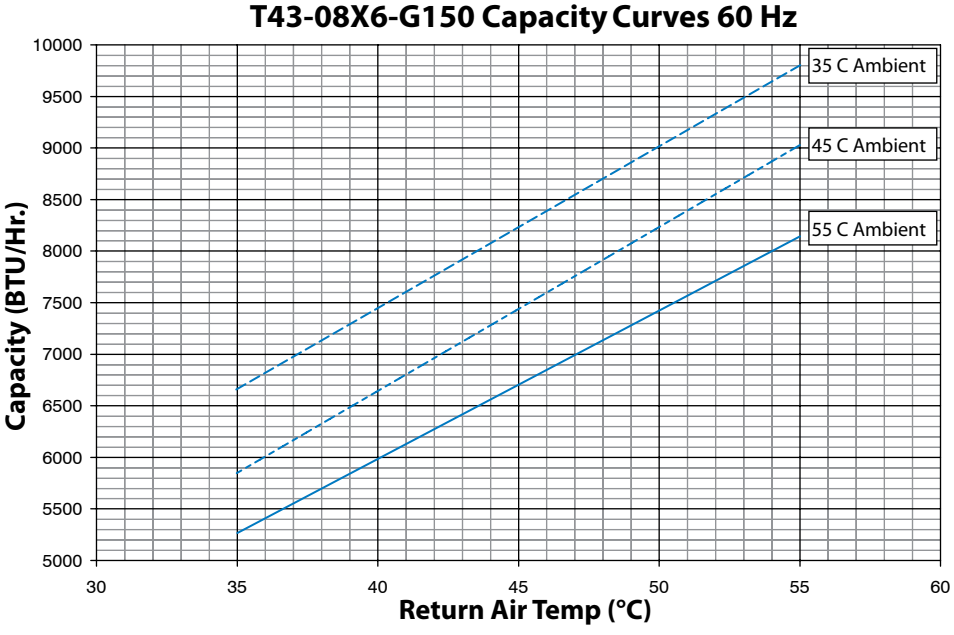
Performance Curves for T43 Models 8000 BTU/Hr. (2344 Watt)





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Performance Data **T43 Models 10000 BTU/Hr. (2930 Watt)**

MODEL NUMBER	T43-1016-G150	T43-1026-G150	T43-1046-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**9670/10300**	**10100/10500**	**10100/10500**
Watts	**2831/3016**	**2957/3075**	**2957/3075**
At 131 F/131 F (55 C/55 C):			
BTUs/Hr. (50/60 Hz)	9667/10290	10039/10669	10039/10669
Watts (50/60 Hz)	2832/3015	2941/3126	2941/3126
At 95 F/95 F (35 C/35 C):			
BTUs/Hr. (50/60 Hz)	7663/8397	8458/8837	8458/8837
Watts (50/60 Hz)	2245/2460	2478/2589	2478/2589
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	32/907	32/907	32/907
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	272/462	320/544	320/544
External loop 50 Hz (CFM/M^3/Hr.)	510/866	568/965	568/965
Internal loop 60 Hz (CFM/M^3/Hr.)	290/493	330/561	330/561
External loop 60 Hz (CFM/M^3/Hr.)	565/960	636/1081	636/1081
Max. Heater Watts (Outdoor Models)	1000	1000	N/A
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1828.5/2288.5	2070	1334/1380
Max. Nominal Current (Amps at 50/60 Hz)	15.9/19.9	9	5
Starting Current (Amps)	57	38	20
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-30 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire leads
ENCLOSURE PROTECTION			
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional		
International Rating	IP56 on the internal loop; IP34 on the external loop		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Enclosure Side on All Base Models		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 M	73.3 dBA		
UNIT CONSTRUCTION			
Material	Galvanized Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat ANSI 70 Light Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	43/1092		
Width (in./mm)	15.75/400		
Depth (in./mm)	10.9/279		
Weight (lb./kg)	125/57		

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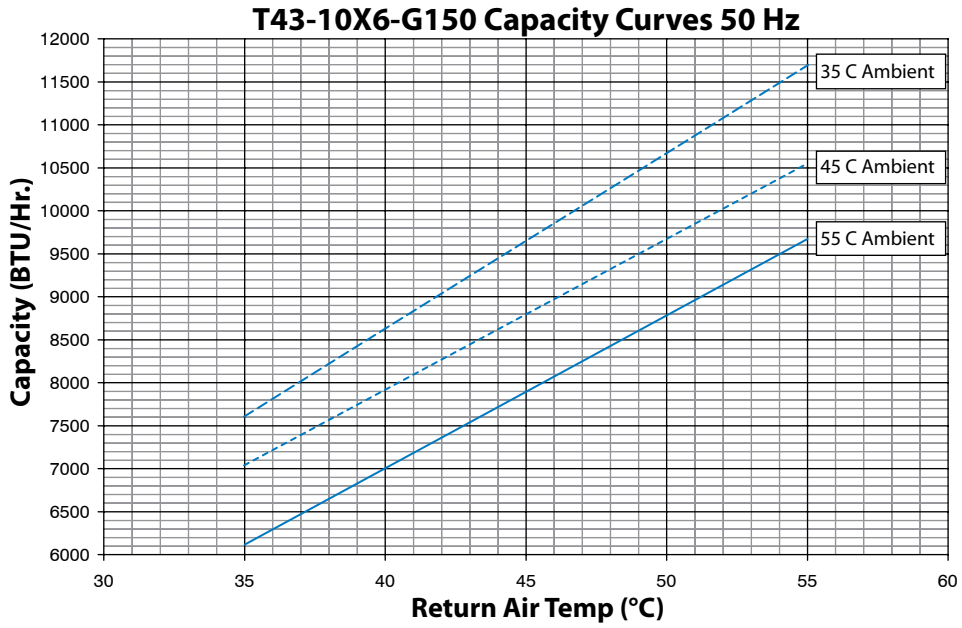
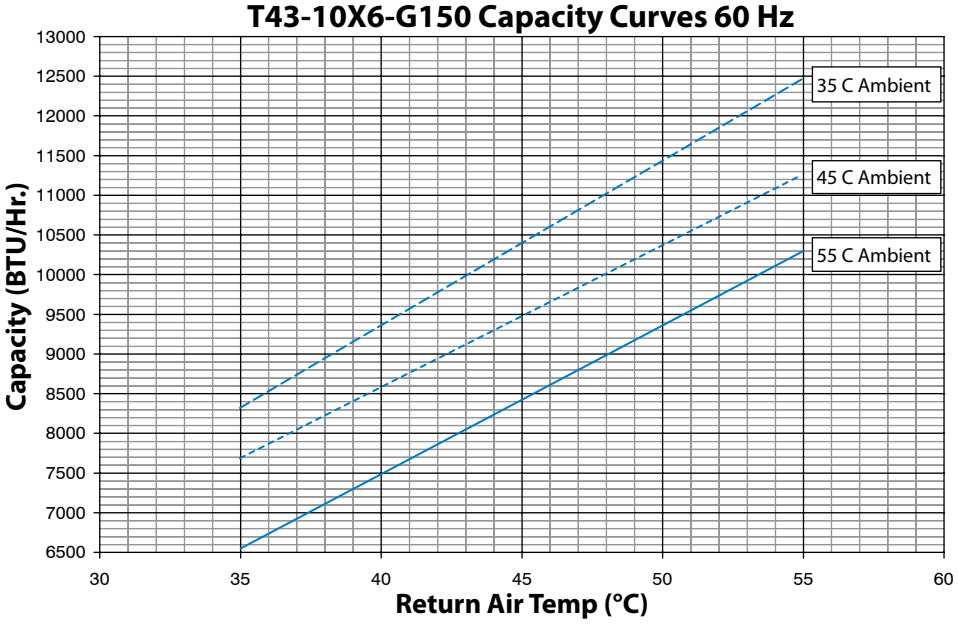
Performance Curves for T43 Models 10000 BTU/Hr. (2930 Watt)





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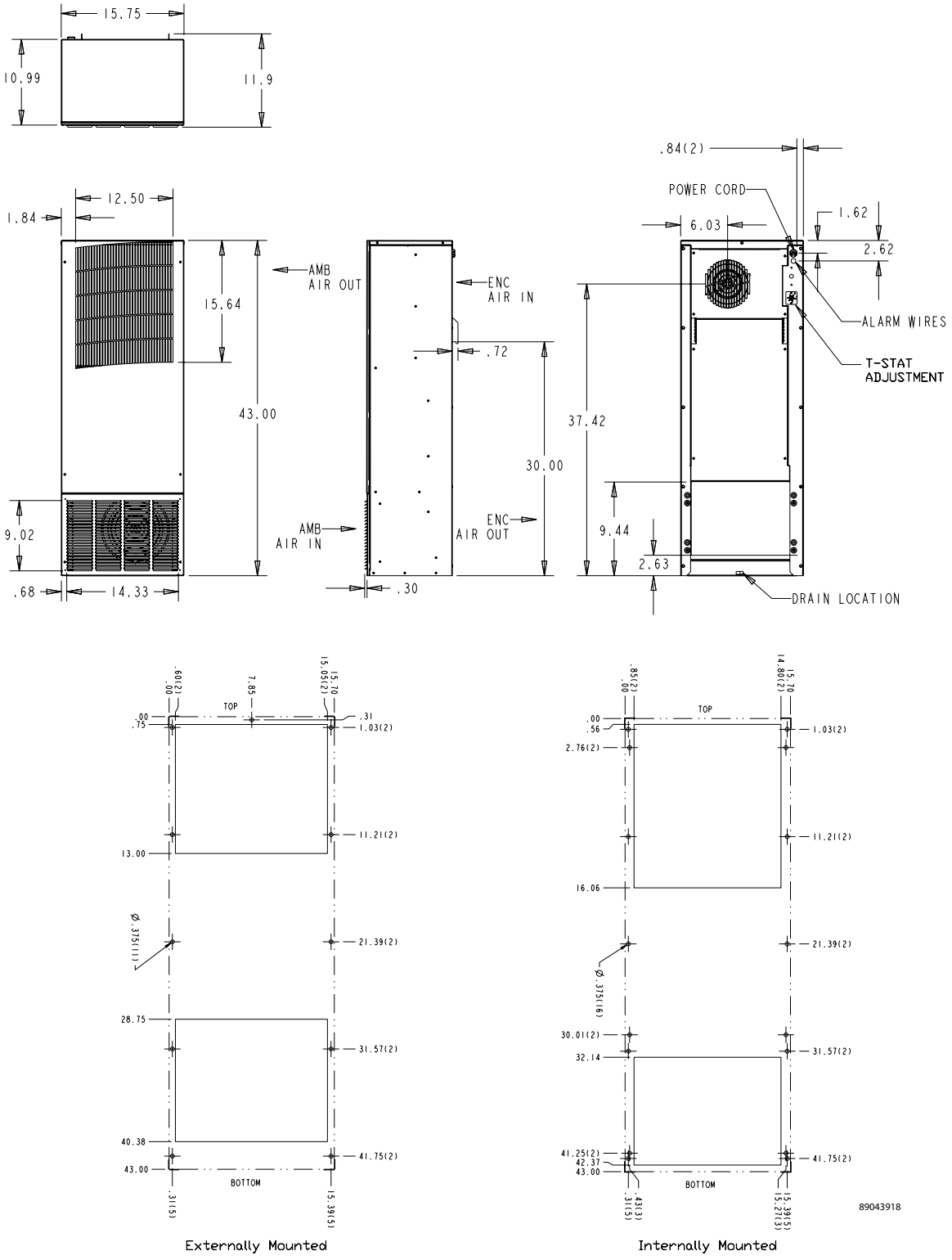
T43 6000 - 10000 Models BTU/Hr. (1758 - 2930 Watt)



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Performance Data **T50 Models 12000 BTU/Hr. (3516 Watt)**

MODEL NUMBER		
	T50-1226-G150	T50-1246-G400
COOLING PERFORMANCE		
Nominal:		
BTUs/Hr.	**11000/12000**	**11000/12000**
Watts	**3223/3516**	**3223/3516**
At 131 F/131 F (55 C/55 C):		
BTUs/Hr. (50/60 Hz)	10030/12000	10030/12000
Watts (50/60 Hz)	2939/3516	2939/3516
At 95 F/95 F (35 C/35 C):		
BTUs/Hr. (50 /60 Hz)	9300/10050	9300/10050
Watts (50/60 Hz)	2725/2945	2725/2945
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	46/1300	46/1300
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	300/510	300/510
External loop 50 Hz (CFM/M^3/Hr.)	520/883	520/883
Internal loop 60 Hz (CFM/M^3/Hr.)	368/626	368/626
External loop 60 Hz (CFM/M^3/Hr.)	625/1062	625/1062
Max. Heater Watts (Outdoor Models)	1500	1500
ELECTRICAL DATA		
Rated Voltage	**220/230**	**460V 1PH**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1804/2139	2070/2346
Max. Nominal Current (Amps at 50/60 Hz)	8.2/9.3	4.5/5.1
Starting Current (Amps)	38	20
Agency Approvals	cUL Listed CE	cUR Recognized CE
Power Input Description	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION		
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional	
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Enclosure Side on All Base Models	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 M	68 dBA	68 dBA
UNIT CONSTRUCTION		
Material	Galvanized Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	50/1270	50/1270
Width (in./mm)	19/483	19/483
Depth (in./mm)	11.05/281	11.05/281
Weight (lb./kg)	164/75	164/75

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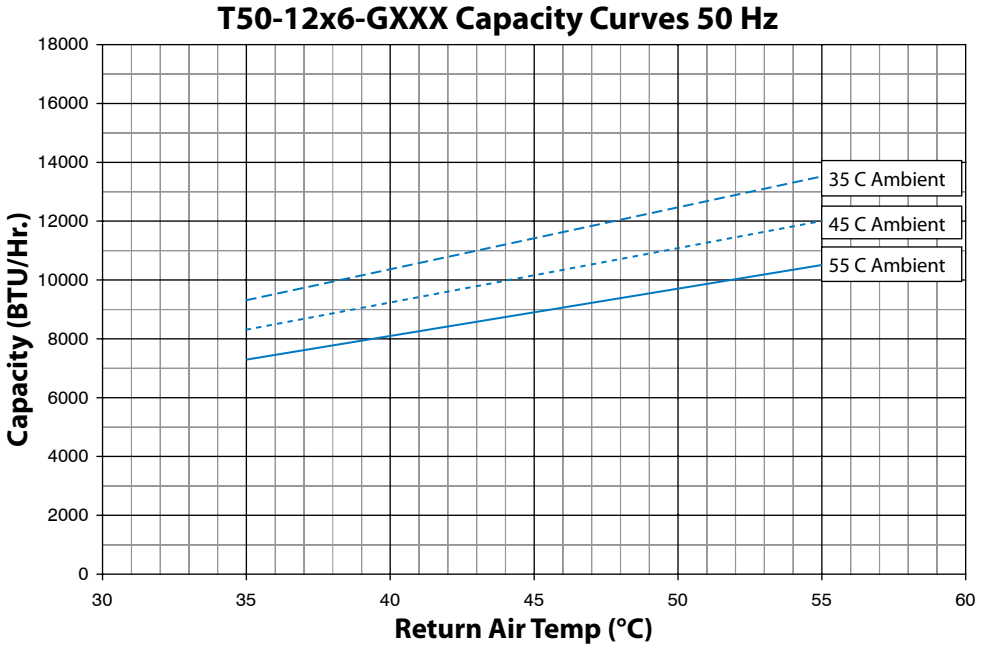
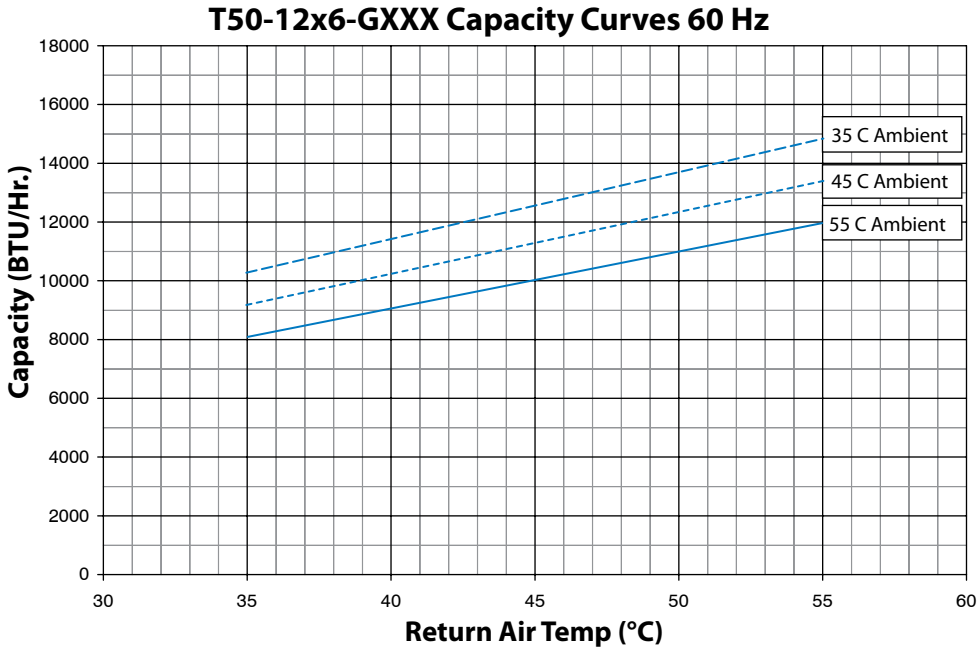
Performance Curves for T50 Models 12000 BTU/Hr. (3516 Watt)





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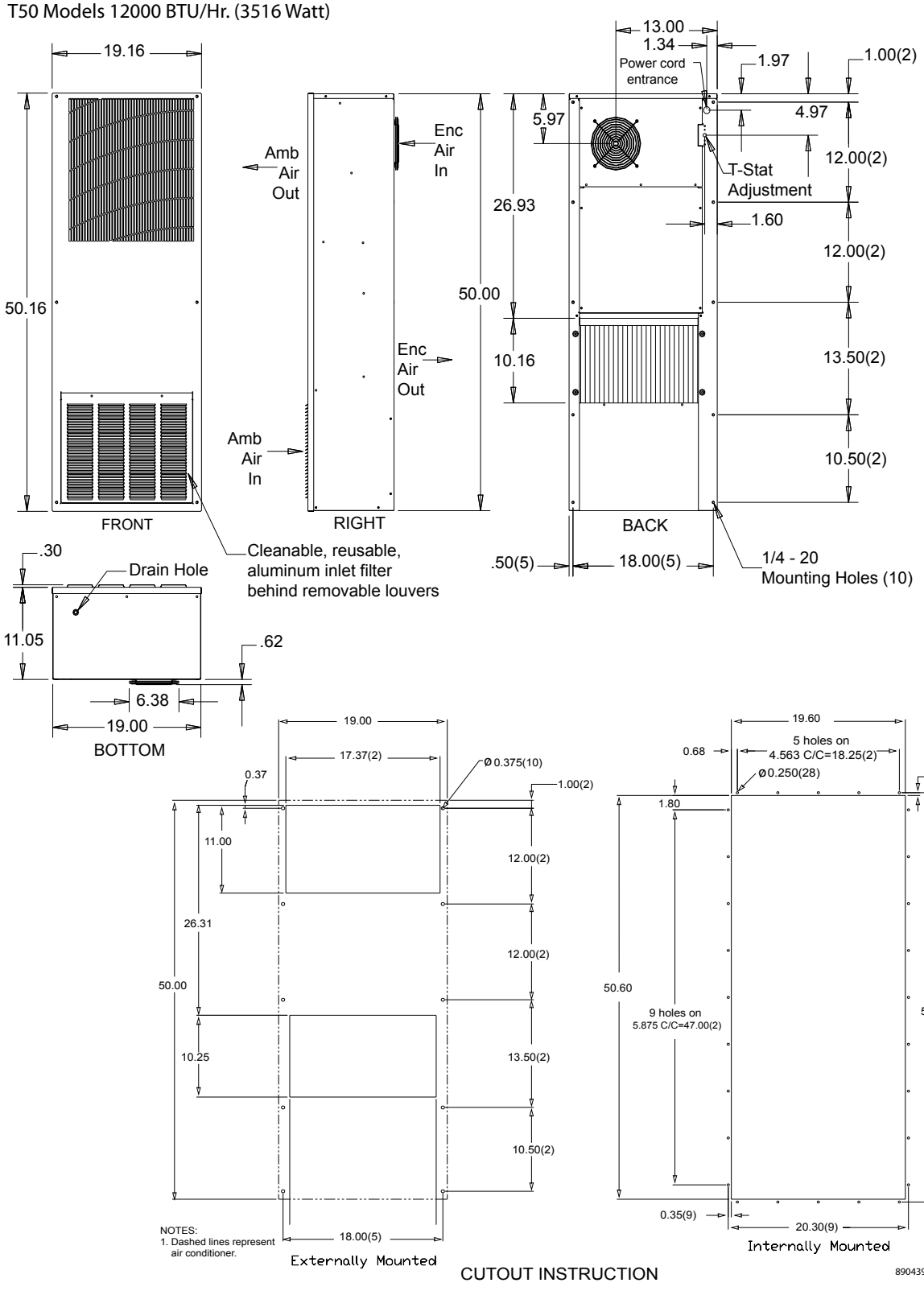
T-Series

T50 Models 12000 BTU/Hr. (3516 Watt)



CUTOUT INSTRUCTION

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Performance Data **T53 Models 19000 BTU/Hr. (5567 Watt)**

MODEL NUMBER		
	T53-1926-G150	T53-1946-G400
COOLING PERFORMANCE		
Nominal:		
BTUs/Hr.	**16800/19000**	**16800/19000**
Watts	**4922/5567**	**4922/5567**
At 131 F/131 F (55 C/55 C):		
BTUs/Hr. (50/60 Hz)	16854/19081	4939/5592
Watts (50/60 Hz)	4939/5592	4939/5592
At 95 F/95 F (35 C/35 C):		
BTUs/Hr. (50 /60 Hz)	15240/19815	15240/19815
Watts (50/60 Hz)	4466/5807	4466/5807
Refrigerant	410A	410A
Refrigerant Charge (ounces/grams)	40/1132	40/1132
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	449/763	449/763
External loop 50 Hz (CFM/M^3/Hr.)	1204/2046	1204/2046
Internal loop 60 Hz (CFM/M^3/Hr.)	519/882	519/882
External loop 60 Hz (CFM/M^3/Hr.)	1300/2209	1300/2209
Max. Heater Watts (Outdoor Models)	3000	
ELECTRICAL DATA		
Rated Voltage	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	3979/4669	4370/5152
Max. Nominal Current (Amps at 50/60 Hz)	17.3/20.3	9.5/11.2
Starting Current (Amps)	54	28
Agency Approvals	cUL Listed CE	cUR Recognized CE
Power Input Description	Terminal Block	
ENCLOSURE PROTECTION		
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional	
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Enclosure Side on All Base Models	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 M	76 dBA	
UNIT CONSTRUCTION		
Material	Galvanized Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	53.0/1346.2	
Width (in./mm)	21.0/533.4	
Depth (in./mm)	13.0/330.2	
Weight (lb./kg)	197/90	237/108

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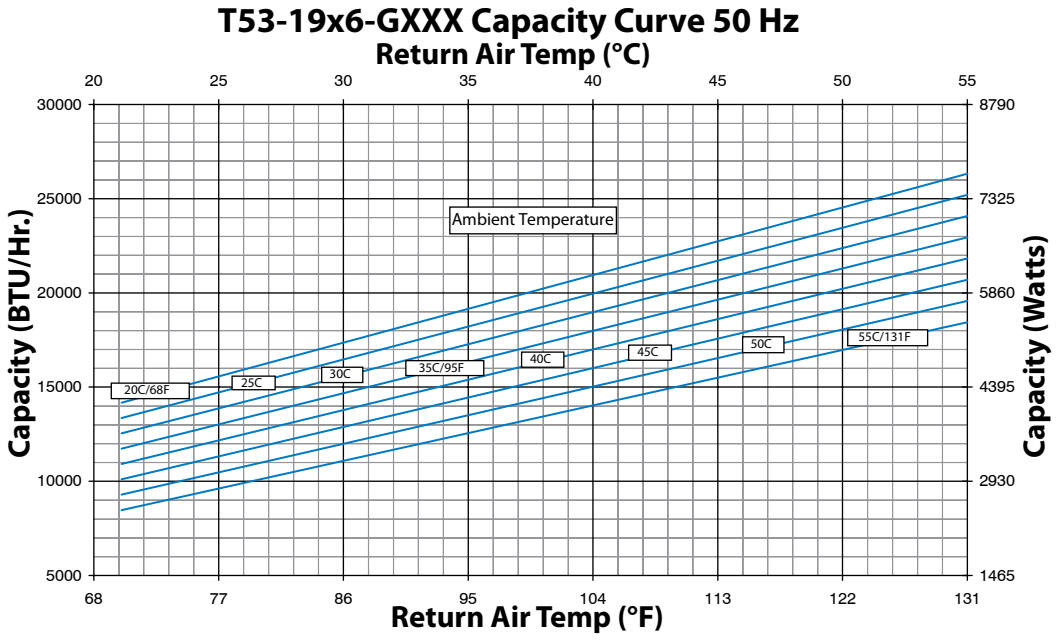
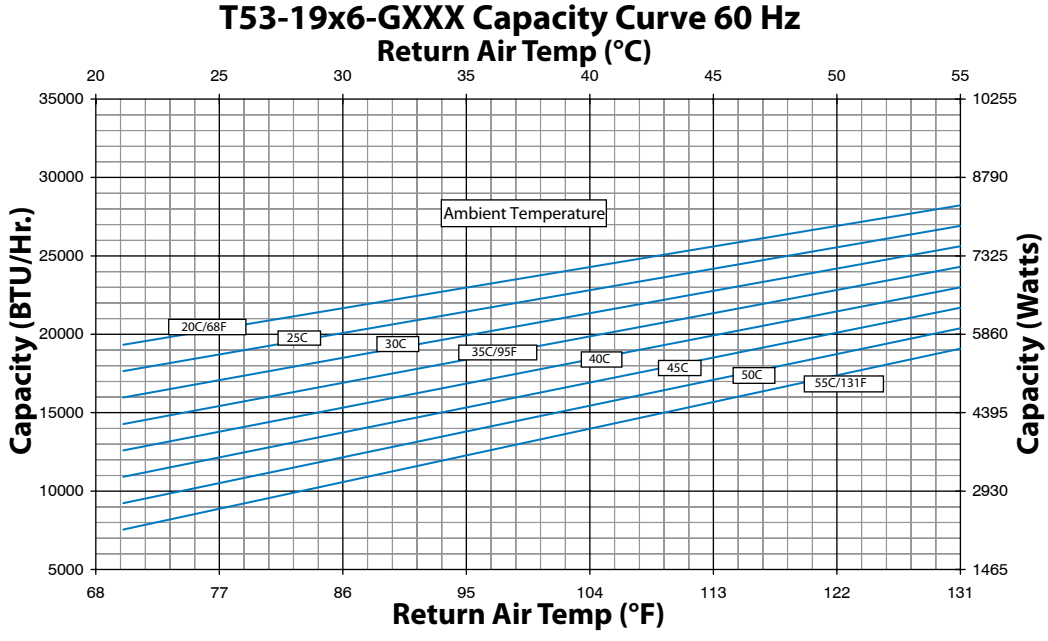
Performance Curves for T53 Models 19000 BTU/Hr. (5567 Watt)





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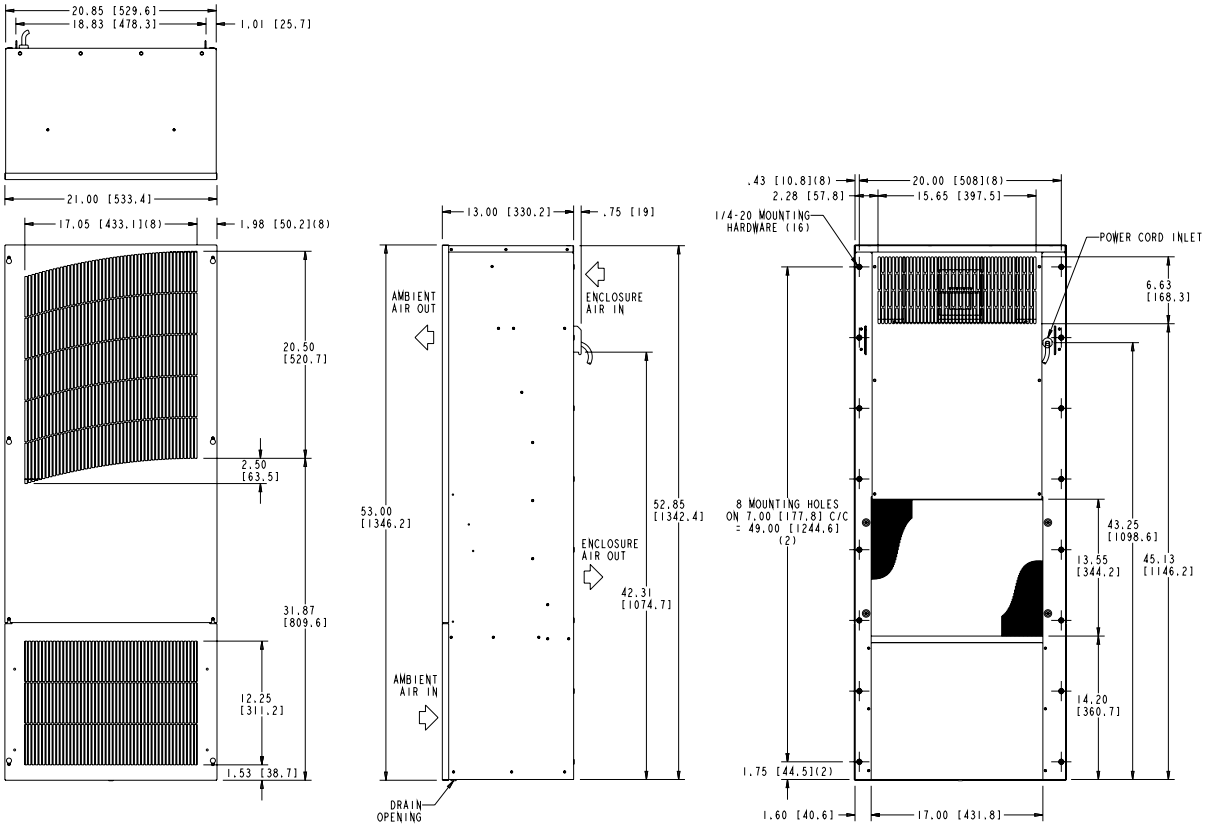
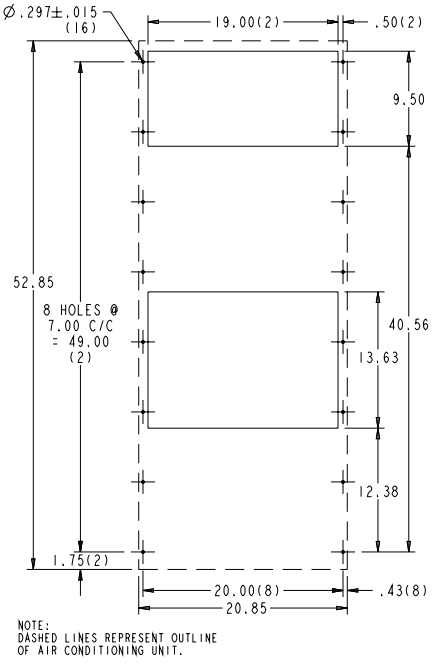
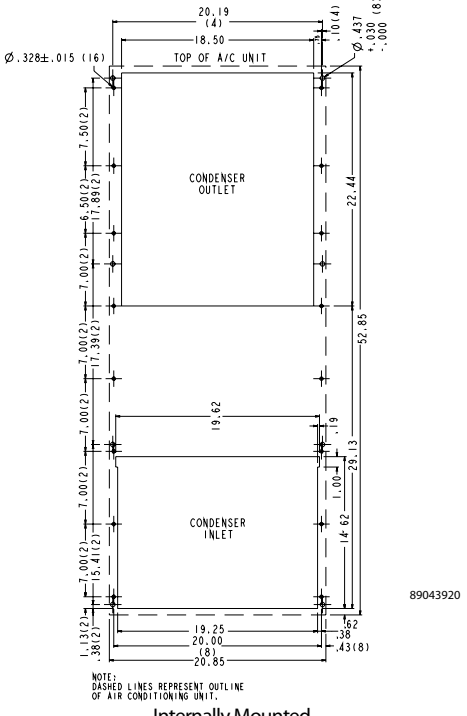
T53 Models 19000 BTU/Hr. (5567 Watt)





Externally Mounted



89043920

Internally Mounted

Cutout Instruction

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Performance Data **T62 Models 20000 BTU/Hr. (5860 Watt)**

MODEL NUMBER		
	T62-2226-G150	T62-2246-G400
COOLING PERFORMANCE		
Nominal:		
BTUs/Hr.	**20500/23500**	**20500/23500**
Watts	**6007/6886**	**6007/6886**
At 131 F/131 F (55 C/55 C):		
BTUs/Hr. (50/60 Hz)	20860/23927	6113/7012
Watts (50/60 Hz)	6113/7012	6113/7012
At 95 F/95 F (35 C/35 C):		
BTUs/Hr. (50 /60 Hz)	18258/20256	18258/20256
Watts (50/60 Hz)	5351/5936	5351/5936
Refrigerant	R-407C	R-407C
Refrigerant Charge (ounces/grams)	42/1300	42/1300
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Minimum (°F/°C)	-40/-40	-40/-40
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	570/968	570/968
External loop 50 Hz (CFM/M^3/Hr.)	1443/2452	1443/2452
Internal loop 60 Hz (CFM/M^3/Hr.)	673/1143	673/1143
External loop 60 Hz (CFM/M^3/Hr.)	1797/3053	1797/3053
Max. Heater Watts (Outdoor Models)	2000	Up to 3000 (Optional)
ELECTRICAL DATA		
Rated Voltage	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	4370/5060	7000/9200
Max. Nominal Current (Amps at 50/60 Hz)	19/22	10.5/12
Starting Current (Amps)	60	30
Agency Approvals	cUL Listed CE	cUR Recognized CE
Power Input Description	Terminal Block	Terminal Block
ENCLOSURE PROTECTION		
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional	
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Enclosure Side on All Base Models	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 M	71 dBA	
UNIT CONSTRUCTION		
Material	Galvanized Sheet Metal Standard	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	61.77/1568.96	61.77/1568.96
Width (in./mm)	19.91/505.71	19.91/505.71
Depth (in./mm)	17.36/440.94	17.36/440.94
Weight (lb./kg)	218/99.1	258/117

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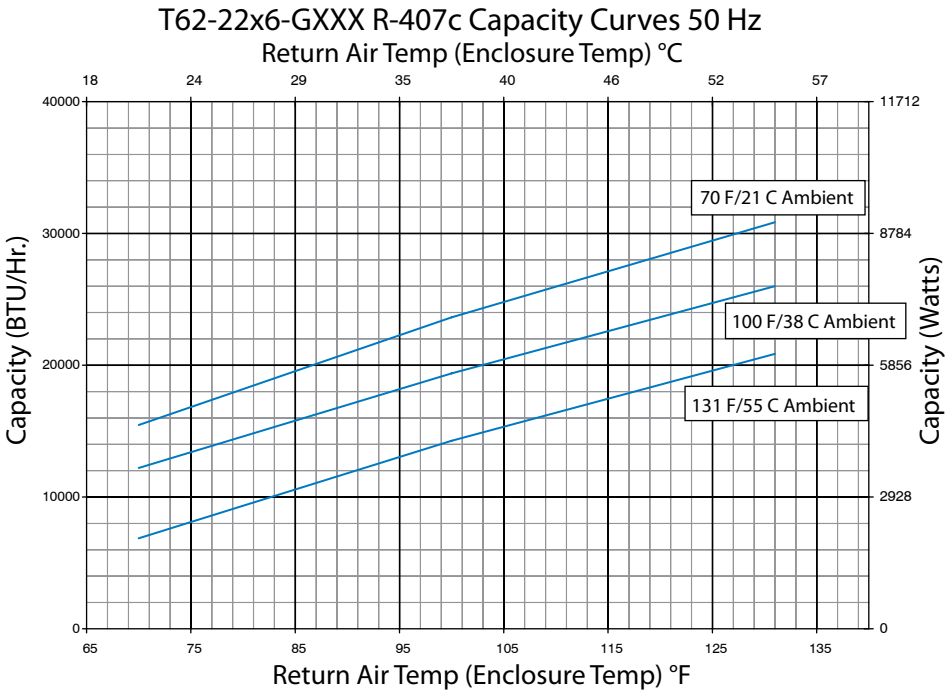
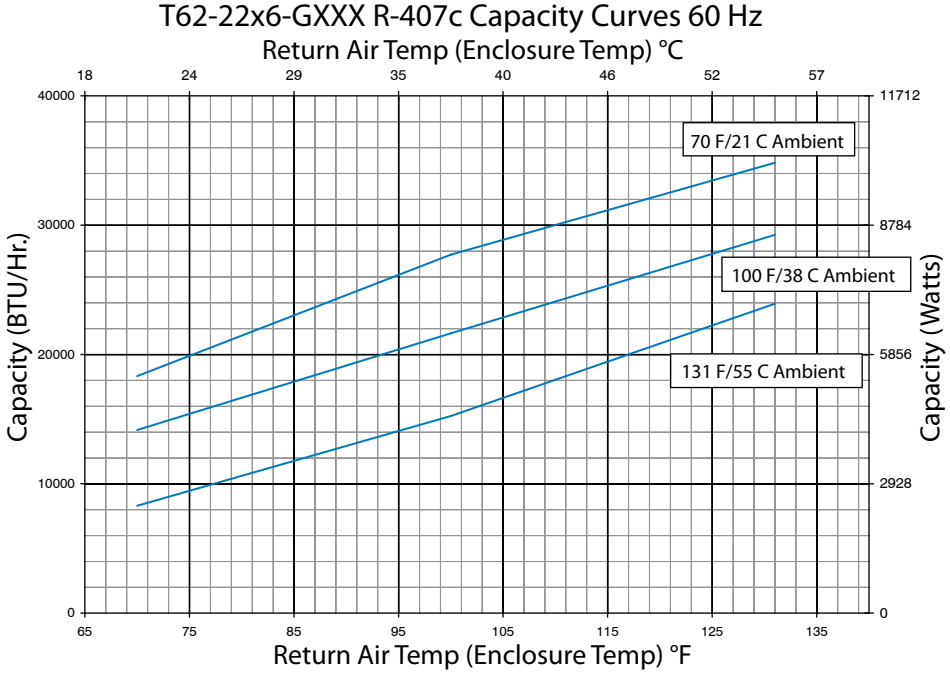
Performance Curves for T62 Models 20000 BTU/Hr. (5860 Watt)


T62-22x6-GXXX R-407c Capacity Curves 50 Hz
Return Air Temp (Enclosure Temp) °C
18 24 29 35 40 46 52 57
40000 30000 20000 10000 0
11712 8784 5856 2928 0
70 F/21 C Ambient
100 F/38 C Ambient
131 F/55 C Ambient
Capacity (BTU/Hr.)
Capacity (Watts)
65 75 85 95 105 115 125 135
Return Air Temp (Enclosure Temp) °F


T62-22x6-GXXX R-407c Capacity Curves 60 Hz
Return Air Temp (Enclosure Temp) °C
18 24 29 35 40 46 52 57
40000 30000 20000 10000 0
11712 8784 5856 2928 0
70 F/21 C Ambient
100 F/38 C Ambient
131 F/55 C Ambient
Capacity (BTU/Hr.)
Capacity (Watts)
65 75 85 95 105 115 125 135
Return Air Temp (Enclosure Temp) °F

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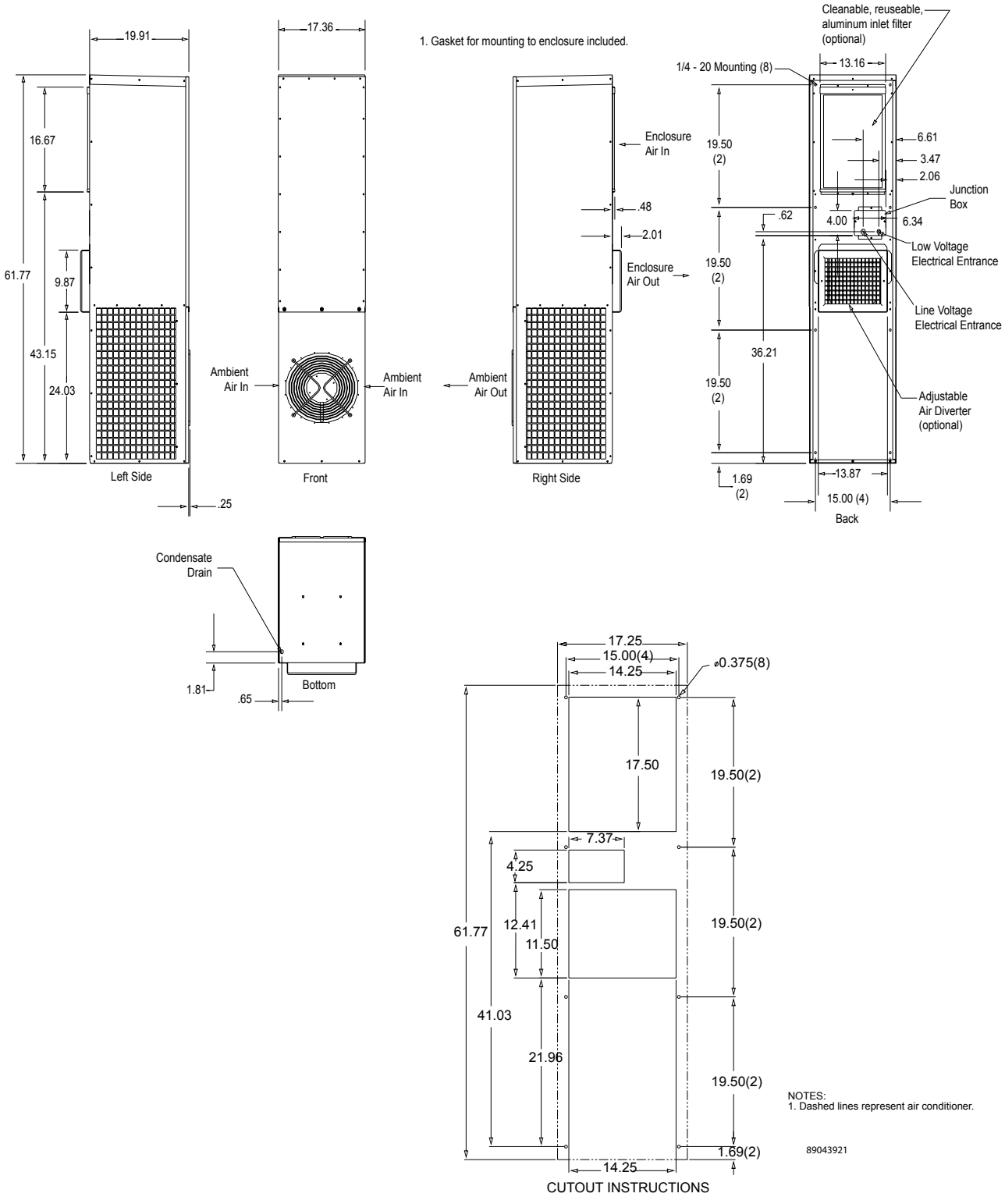
T-Series

T62 Models 20000 BTU/Hr. (5860 Watt)



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Performance Data **T70-36 Models 36000 BTU/Hr. (10548 Watt)**

MODEL NUMBER	
	T70-3626-G150
COOLING PERFORMANCE	
Nominal:	
BTUs/Hr.	**39000/43000**
Watts	**11430/12602**
At 131 F/131 F (55 C/55 C):	
BTUs/Hr. (50/60 Hz)	38613/42930
Watts (50/60 Hz)	11316/12570
At 95 F/95 F (35 C/35 C):	
BTUs/Hr. (50 /60 Hz)	31364/36130
Watts (50/60 Hz)	9192/10579
Refrigerant	R-407C
Refrigerant Charge (ounces/grams)	110/3318
Operating Temperature Range:	
Maximum (°F/°C)	131/55
Minimum (°F/°C)	-40/-40
Air Flow at 0 Static Pressure:	
Internal loop 50 Hz (CFM/M^3/Hr.)	1085/1843
External loop 50 Hz (CFM/M^3/Hr.)	2176/3697
Internal loop 60 Hz (CFM/M^3/Hr.)	1171/1989
External loop 60 Hz (CFM/M^3/Hr.)	2347/3987
Max. Heater Watts (Outdoor Models)	2000 Standard (5000 Optional)
ELECTRICAL DATA	
Rated Voltage	**230**
Frequency (Hz)	50/60
Operating Range	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	8280
Max. Nominal Current (Amps at 50/60 Hz)	36
Starting Current (Amps)	104
Agency Approvals	cUL Listed CE Others available upon request
Power Input Description	Terminal Block
ENCLOSURE PROTECTION	
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional
International Rating	UL/cUL Listed
CONTROLLER	
Description	Basic Mechanical Thermostat
Thermostat Location	Enclosure Side on All Base Models
Factory Thermostat Setting (°F/°C)	80/27
SOUND LEVEL	
At 1.5 M	66 dBA
UNIT CONSTRUCTION	
Material	Galvanized Sheet Metal Standard Stainless Steel Optional
Finish	Powder Coat ANSI 70 Light Gray Standard
UNIT DIMENSIONS	
Height (in./mm)	69.8/1772
Width (in./mm)	22.8/578
Depth (in./mm)	20.94/532

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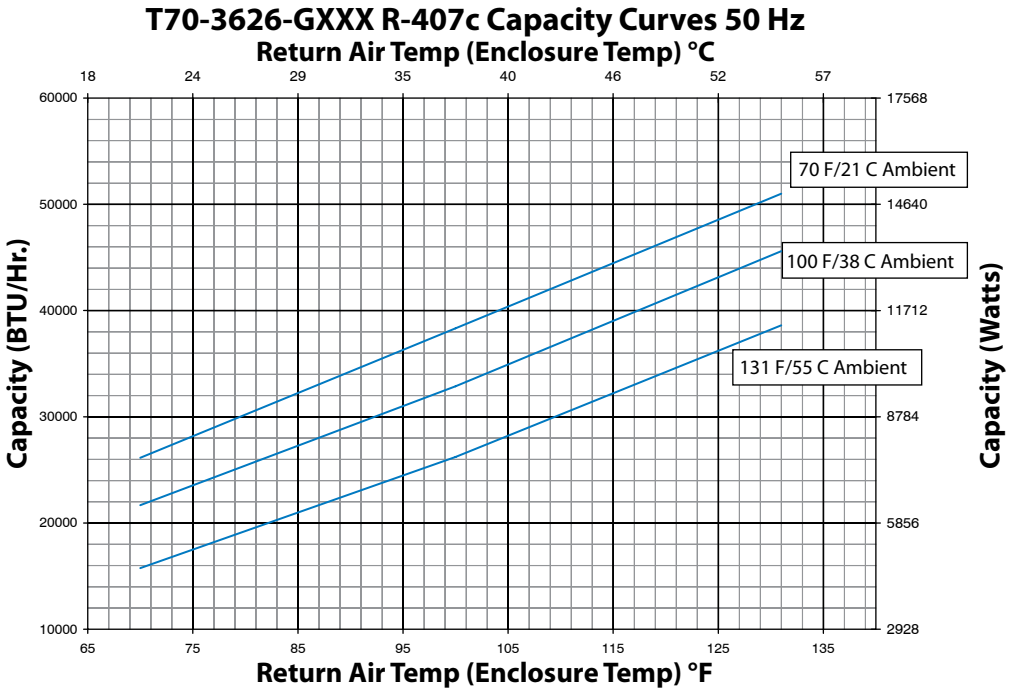
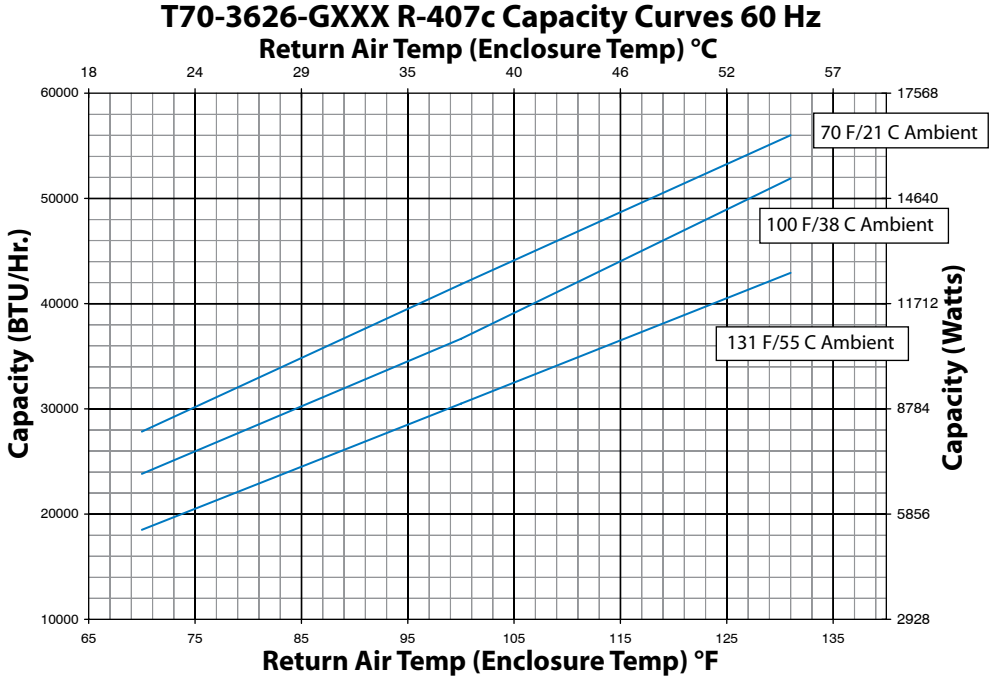
Performance Curves for T70 Models 36000 BTU/Hr. (10548 Watt)


T70-3626-GXXX R-407c Capacity Curves 50 Hz
Return Air Temp (Enclosure Temp) °C
18 24 29 35 40 46 52 57
60000 50000 40000 30000 20000 10000
17568 14640 11712 8784 5856 2928
70 F/21 C Ambient
100 F/38 C Ambient
131 F/55 C Ambient
Capacity (BTU/Hr.)
Capacity (Watts)
65 75 85 95 105 115 125 135
Return Air Temp (Enclosure Temp) °F


T70-3626-GXXX R-407c Capacity Curves 60 Hz
Return Air Temp (Enclosure Temp) °C
18 24 29 35 40 46 52 57
60000 50000 40000 30000 20000 10000
17568 14640 11712 8784 5856 2928
70 F/21 C Ambient
100 F/38 C Ambient
131 F/55 C Ambient
Capacity (BTU/Hr.)
Capacity (Watts)
65 75 85 95 105 115 125 135
Return Air Temp (Enclosure Temp) °F

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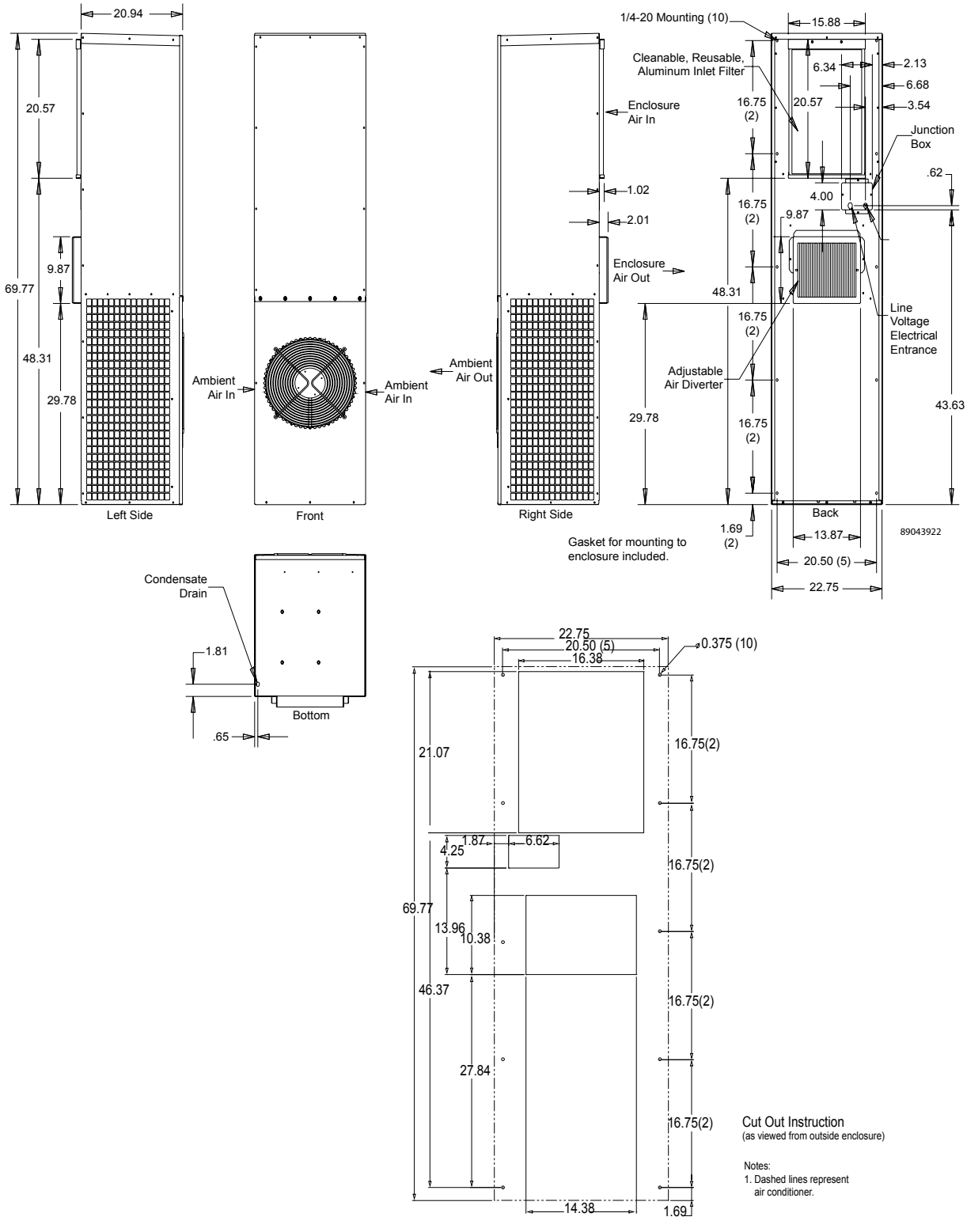
T70 Models 36000 BTU/Hr. (10548 Watt)



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Performance Data **T70-60 Models 59000 BTU/Hr. (17287 Watt)**

MODEL NUMBER	
	T70-6026-G150
COOLING PERFORMANCE	
Nominal:	
BTUs/Hr.	**51900/60000**
Watts	**15210/17584**
At 122 F/122 F (50 C/50 C):	
BTUs/Hr. (50/60 Hz)	51900/60000
Watts (50/60 Hz)	15210/17584
At 95 F/95 F (35 C/35 C):	
BTUs/Hr. (50 /60 Hz)	47122/54500
Watts (50/60 Hz)	13810/15972
Refrigerant	R-407C
Refrigerant Charge (ounces/grams)	150/4252
Operating Temperature Range:	
Maximum (°F/°C)	122/50
Minimum (°F/°C)	-40/-40
Air Flow at 0 Static Pressure:	
Internal loop 50 Hz (CFM/M^3/Hr.)	1510/2565
External loop 50 Hz (CFM/M^3/Hr.)	2716/4614
Internal loop 60 Hz (CFM/M^3/Hr.)	1629/2767
External loop 60 Hz (CFM/M^3/Hr.)	2931/4979
Max. Heater Watts (Outdoor Models)	
ELECTRICAL DATA	
Rated Voltage	**200/230**
Frequency (Hz)	50/60
Operating Range	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	7000/9200
Max. Nominal Current (Amps at 50/60 Hz)	35/40
Starting Current (Amps)	144
Agency Approvals	cUL Listed CE Others available upon request
Power Input Description	Terminal Block
ENCLOSURE PROTECTION	
UL Type	Type 12/3R/4 Standard 4X Stainless Steel Optional
International Rating	IP56 on the internal loop; IP34 on the external loop
Description	Basic Mechanical Thermostat
CONTROLLER	
Thermostat Location	Enclosure Side on All Base Models
Factory Thermostat Setting (°F/°C)	80/27
SOUND LEVEL	
At 1.5 M	66 dBA
UNIT CONSTRUCTION	
Material	Galvanized Sheet Metal Standard Stainless Steel Optional
Finish	Powder Coat ANSI 70 Light Gray Standard
UNIT DIMENSIONS	
Height (in./mm)	69.77/1772
Width (in./mm)	35.86/911
Depth (in./mm)	22.94/583
Weight (lb./kg)	419/190.5

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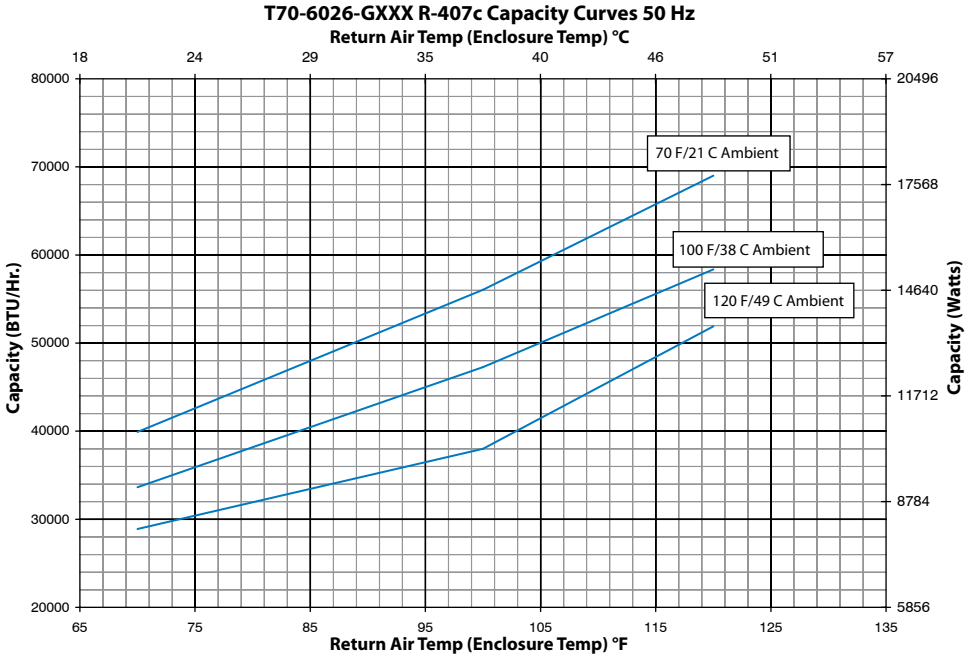
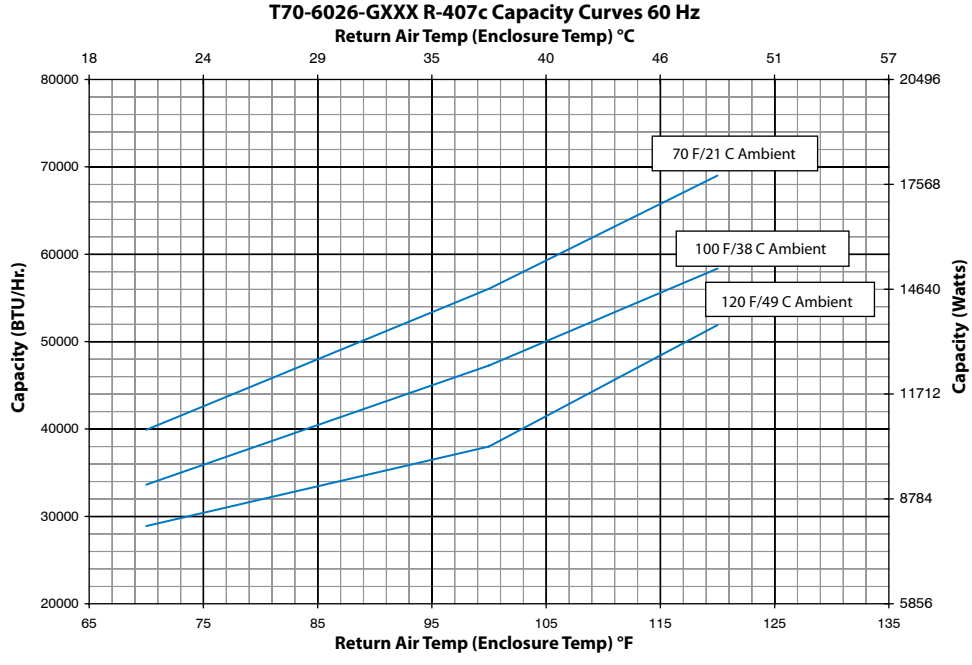
Performance Curves for T70 Models 59000 BTU/Hr. (17287 Watt)


T70-6026-GXXX R-407c Capacity Curves 50 Hz
Return Air Temp (Enclosure Temp) °C
18 24 29 35 40 46 51 57
80000 70000 60000 50000 40000 30000 20000
20496 17568 14640 11712 8784 5856
Capacity (BTU/Hr.)
Capacity (Watts)
70 F/21 C Ambient
100 F/38 C Ambient
120 F/49 C Ambient
65 75 85 95 105 115 125 135
Return Air Temp (Enclosure Temp) °F


T70-6026-GXXX R-407c Capacity Curves 60 Hz
Return Air Temp (Enclosure Temp) °C
18 24 29 35 40 46 51 57
80000 70000 60000 50000 40000 30000 20000
20496 17568 14640 11712 8784 5856
Capacity (BTU/Hr.)
Capacity (Watts)
70 F/21 C Ambient
100 F/38 C Ambient
120 F/49 C Ambient
65 75 85 95 105 115 125 135
Return Air Temp (Enclosure Temp) °F

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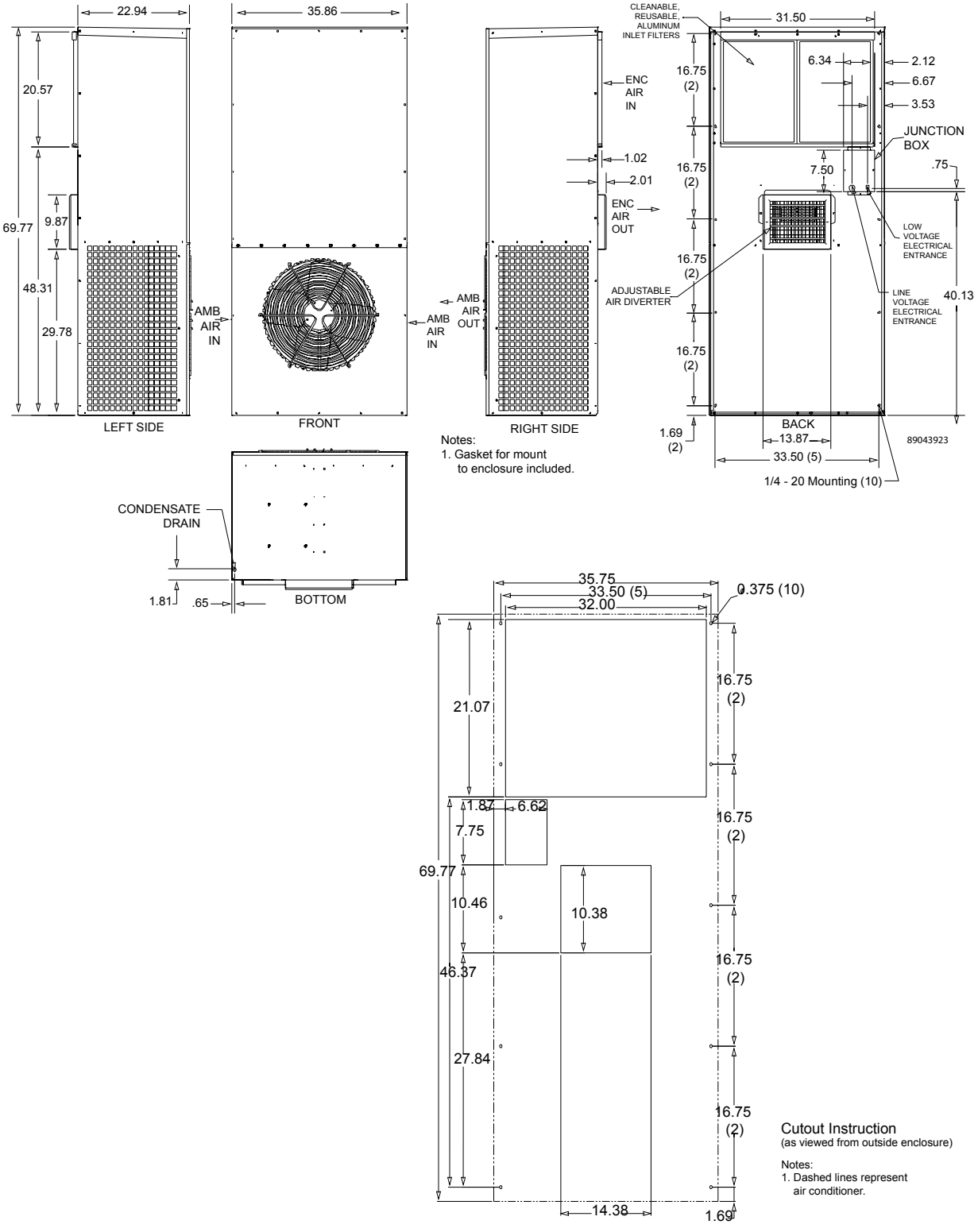
T70 Models 59000 BTU/Hr. (17287 Watt)



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GENESIS® Indoor Air Conditioners

M52 460 Volt 3-Phase Model

M28 Model

M17 Model

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The specifier's choice for cooling industrial process controls

GENESIS® Indoor Air Conditioners

PRODUCT OVERVIEW

The Type 12 air conditioner of choice for light-duty manufacturing process control applications. Compact, narrow and 460 volt 3-phase models available.

APPLICATIONS

- Industrial drive enclosures
- Automotive assembly systems
- Material handling applications
- Other process control systems

GENESIS Chapter Contents

Indoor Air Conditioners 70
M13 Models 1000 BTU/Hr.....71
M17 Models 1800 BTU/Hr.....73
M28 Models 2200 BTU/Hr.....75
M28 Models 4000 BTU/Hr.....76
M28 Models 6000 BTU/Hr.....77
M33 Models 4000 BTU/Hr.....79
M36 Models 6000 BTU/Hr.....81
M52-3 Phase Models
4100-10000 BTU/Hr. 83

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Indoor Air Conditioners

M17
1800 BTU/Hr.
527 Watt

M28
2200-6000 BTU/Hr.
645-1758 Watts

M36
6000 BTU/Hr.
1760 Watt

M52 3-Phase
4100-10000 BTU/Hr.
1201-2930 Watts

Industry Standards

UL/cUL Listed, CE, others available upon request

- Type 12

Application

- Industrial automation
- Package handling equipment
- Security and defense systems
- And more

Features

- Robust reciprocating compressor
- R134a or R407c earth-friendly refrigerant and RoHS compliant
- Models for 115, 230 and 460 single phase AC volt power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from 50 F/10 C to 125 F/52 C
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat located behind the filter of the unit. Indoor Air Conditioner models include digital display on ambient side.
- Low-carbon mild-steel sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cleanable, reusable aluminum mesh filter to protect coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Indoor Air Conditioner models also include:
  - Electro-Mechanical Thermostat
  - Surge Suppressor
  - Condensate Management System

Finish

- RAL 7042 gray powder-coat paint in a semi-gloss finish
- Other colors and textures available

Options

- Thermostat Malfunction Package
- Special Voltage Package
- Active Condensate Evaporator Package
- Outdoor Package*
- Harsh Environment Package*
- Stainless Steel Package*
- Heater Package*

* T-Series or PROAIR™ may be more appropriate. Refer to T-Series A/C and PROAIR A/C chapters. Consult the factory for availability and catalog number.

Notes

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Performance Data **M13 Models 1000 BTU/Hr. (293 Watt)**

MODEL NUMBER	M13-0116-G1014	M13-0126-G1008	M13-0116-G1400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**800/1000**	**800/1000**	**800/1000**
Watts	**234/293**	**234/293**	**234/293**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	5.5/156	5.5/156	5.5/156
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	71/121	75/127	75/127
External loop 50 Hz (CFM/M^3/Hr.)	75/127	71/121	71/121
Internal loop 60 Hz (CFM/M^3/Hr.)	74/126	78/132	78/132
External loop 60 Hz (CFM/M^3/Hr.)	78/132	74/126	74/126
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	460	483	552
Max. Nominal Current (Amps at 50/60 Hz)	4	2.2/2.1	1.2
Starting Current (Amps)	18	8.5	5
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-15 plug on 6- ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12 Standard		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Behind Filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	56 dBA		
UNIT CONSTRUCTION			
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat RAL 7042 Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	13.25/337	13.25/337	17.75/450.9
Width (in./mm)	14.25/362	14.25/362	14.25/362
Depth (in./mm)	7.8/198	7.8/198	7.8/198
Weight (lb./kg)	48/22	48/22	58/26

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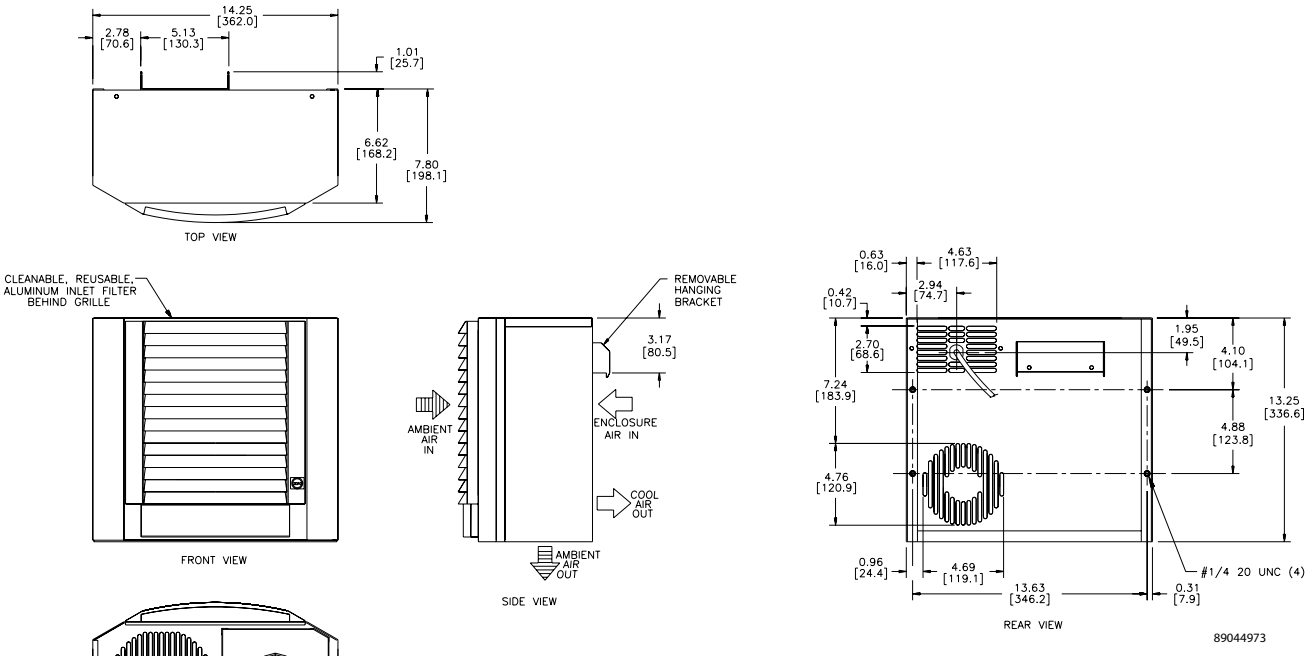
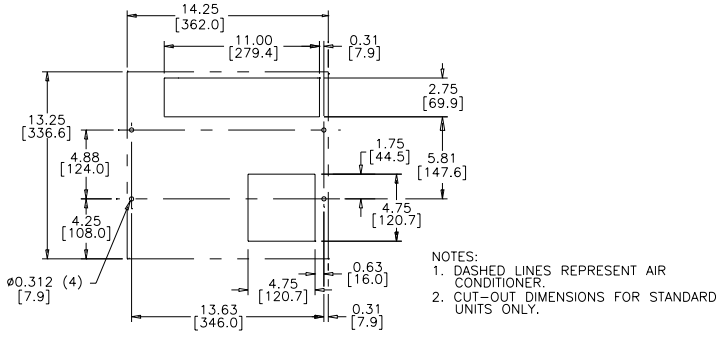
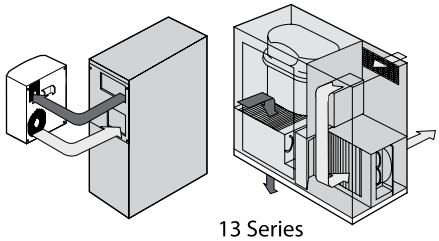
M13 Models 1000 BTU/Hr. (293 Watt)





Cutout Instructions



13 Series

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Performance Data **M17 Models 1800 BTU/Hr. (527 Watt)**

MODEL NUMBER			
	M17-0216-G009	M17-0226-G004	M17-0246-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**1500/1800**	**1500/1800**	**1500/1800**
Watts	**440/527**	**440/527**	**440/527**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	6/170	6/170	6/170
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	67/114	125/212	125/212
External loop 50 Hz (CFM/M^3/Hr.)	112/190	144/245	144/245
Internal loop 60 Hz (CFM/M^3/Hr.)	79/134	125/212	125/212
External loop 60 Hz (CFM/M^3/Hr.)	130/221	161/274	161/274
ELECTRICAL DATA			
Rated Voltage	**110/115**	**220/230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	726/770.5	924/851	1058/920
Max. Nominal Current (Amps at 50/60 Hz)	6.6/6.7	4.2/3.7	2.3/2.0
Starting Current (Amps)	28	14.4	7.4
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12 Standard		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Behind Filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	60 dBA		
UNIT CONSTRUCTION			
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat RAL 7042 Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	17.65/448	17.65/448	22.15/562.6
Width (in./mm)	12/305	12/305	12/305
Depth (in./mm)	8.68/220	8.68/220	8.68/220
Weight (lb./kg)	56/25	56/25	66/30

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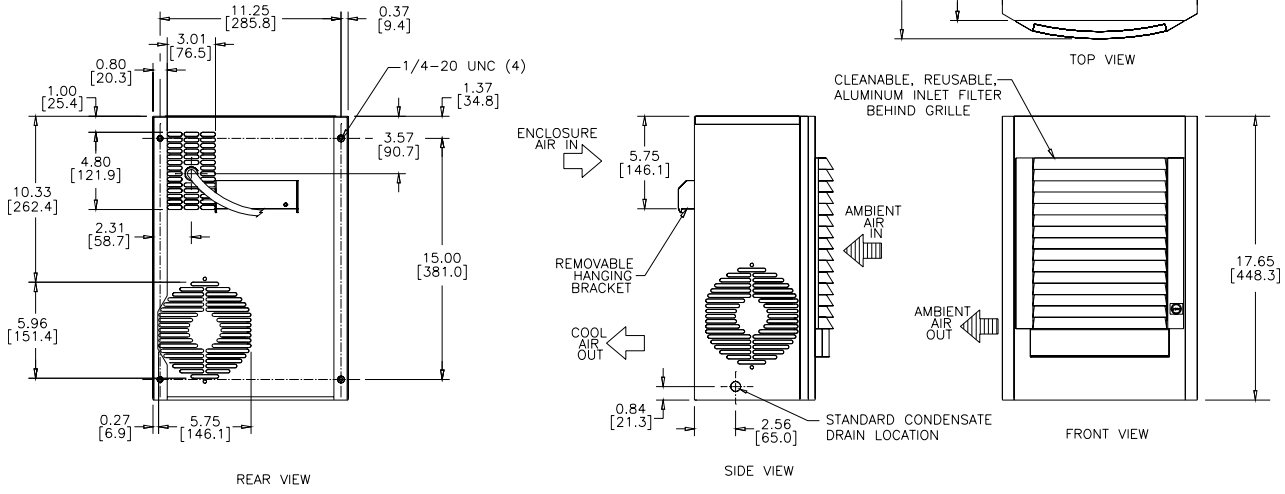
M17 Models 1800 BTU/Hr. (527 Watt)



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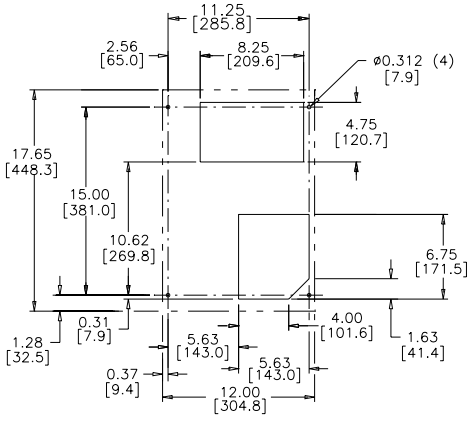
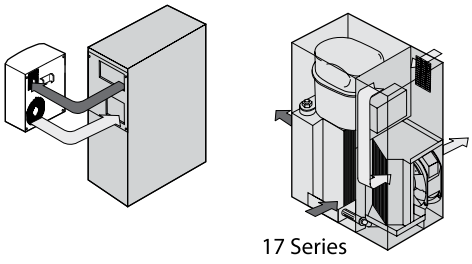


NOTES:
1. DASHED LINES REPRESENT AIR CONDITIONER.
2. CUT–OUT DIMENSIONS FOR STANDARD UNITS ONLY

Cutout Instructions



17 Series

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Performance Data **M28 Models 2200 BTU/Hr. (645 Watt)**

MODEL NUMBER	M28-0216-G013	M28-0226-G004	M28-0246-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**2200/2200**	**2200/2200**	**2200/2200**
Watts	**645/645**	**645/645**	**645/645**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	11/312	10/284	10/284
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	146/248	175/297	175/297
External loop 50 Hz (CFM/M^3/Hr.)	230/391	225/382	225/382
Internal loop 60 Hz (CFM/M^3/Hr.)	170/289	210/357	210/357
External loop 60 Hz (CFM/M^3/Hr.)	260/442	255/433	255/433
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1127/1035	1150/1035	1288/1150
Max. Nominal Current (Amps at 50/60 Hz)	9.8/9.0	5.0/4.5	2.8/2.5
Starting Current (Amps)	28	14.4	7.4
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12 Standard		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Behind Filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	55 dBA		
UNIT CONSTRUCTION			
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat RAL 7042 Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	28.5/724	28.5/724	28.5/724
Width (in./mm)	17/432	17/432	17/432
Depth (in./mm)	11.3/288	11.3/288	11.3/288
Weight (lb./kg)	98/45	98/45	108/49

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Performance Data **M28 Models 4000 BTU/Hr. (1172 Watt)**

MODEL NUMBER	M28-0416-G007	M28-0426-G032	M28-0446-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**3800/4000**	**3800/4000**	**3800/4000**
Watts	**1114/1172**	**1114/1172**	**1114/1172**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	11/312	11/312	11/312
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	153/260	146/248	146/248
External loop 50 Hz (CFM/M^3/Hr.)	230/391	225/382	225/382
Internal loop 60 Hz (CFM/M^3/Hr.)	174/296	166/282	166/282
External loop 60 Hz (CFM/M^3/Hr.)	260/442	255/433	255/433
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1679/1610	1702/1587	1886/1748
Max. Nominal Current (Amps at 50/60 Hz)	14.6/14.0	7.4/6.9	4.1/3.8
Starting Current (Amps)	48	23	12
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12 Standard		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Behind Filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters			
UNIT CONSTRUCTION			
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat RAL 7042 Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	28.5/724	28.5/724	28.5/724
Width (in./mm)	17/432	17/432	17/432
Depth (in./mm)	11.3/288	11.3/288	11.3/288
Weight (lb./kg)	116/53	116/53	136/62

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Technical Data **M28 Models 6000 BTU/Hr. (1758 Watt)**

MODEL NUMBER			
	M28-0616-G005	M28-0626-G005	M26-0646-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**5400/6000**	**5400/6000**	**5400/6000**
Watts	**1582/1758**	**1582/1758**	**1582/1758**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	15/425	15/425	15/425
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	153/260	146/248	146/248
External loop 50 Hz (CFM/M^3/Hr.)	325/552	325/552	325/552
Internal loop 60 Hz (CFM/M^3/Hr.)	174/296	166/282	166/282
External loop 60 Hz (CFM/M^3/Hr.)	373/634	373/634	373/634
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1886/1978	1840	2024
Max. Nominal Current (Amps at 50/60 Hz)	16.4/17.2	8	4.4
Starting Current (Amps)	58.8	27.4	14
Agency Approvals	cUR Recognized CE	cUL Listed CE	cUR Recognized CE
Power Input Description	6-ft. cord with wire terminations	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type		Type 12 Standard	
CONTROLLER			
Description		Basic Mechanical Thermostat	
Thermostat Location		Behind Filter	
Factory Thermostat Setting (°F/°C)		80/27	
SOUND LEVEL			
At 1.5 Meters		62 dBA	
UNIT CONSTRUCTION			
Material		Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish		Powder Coat RAL 7042 Gray Standard	
UNIT DIMENSIONS			
Height (in./mm)		28.5/724	
Width (in./mm)		17/432	
Depth (in./mm)		11.3/288	
Weight (lb./kg)	120/55	120/55	150/68

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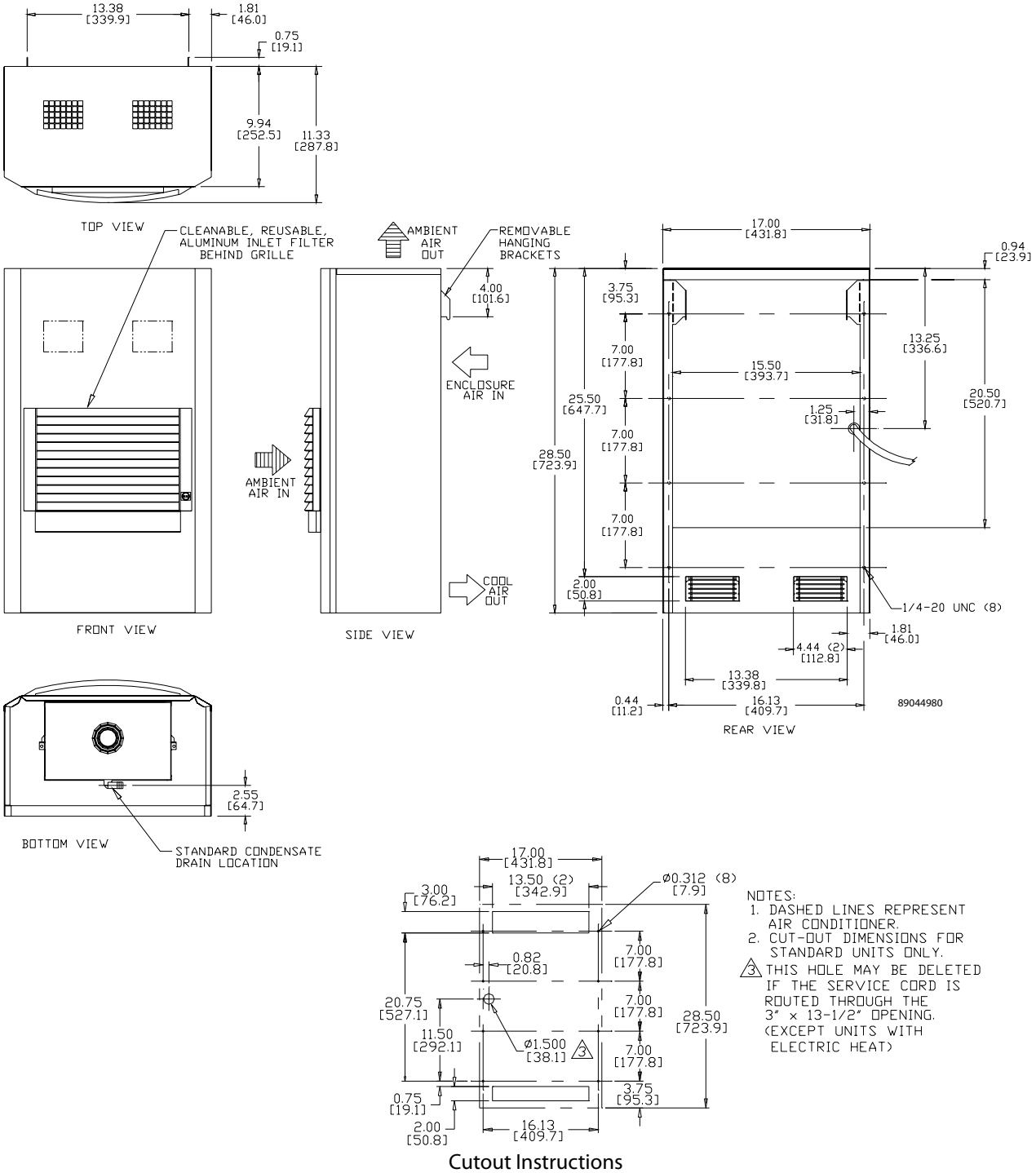
M28 Models 2200-6000 BTU/Hr. (645-1758 Watt)



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Performance Data **M33 Models 4000 BTU/Hr. (1172 Watt)**

MODEL NUMBER	M33-0416-G010	M33-0426-G009	M33-0446-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**3700/4000**	**3700/4000**	**3700/4000**
Watts	**1084/1172**	**1084/1172**	**1084/1172**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	14/398	14/398	14/398
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	135/229	100/170	100/170
External loop 50 Hz (CFM/M^3/Hr.)	300/510	296/503	296/503
Internal loop 60 Hz (CFM/M^3/Hr.)	145/246	110/187	110/187
External loop 60 Hz (CFM/M^3/Hr.)	355/603	349/593	349/593
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1495/1518	1656/1679	1840
Max. Nominal Current (Amps at 50/60 Hz)	13.0/13.2	7.2/7.3	4
Starting Current (Amps)	48	23	12
Agency Approvals	cUL Listed CE		cUR Recognized CE
Power Input Description	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12 Standard		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Behind Filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	61 dBA		
UNIT CONSTRUCTION			
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat RAL 7042 Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	34.37/873	34.37/873	34.37/873
Width (in./mm)	12/305	12/305	12/305
Depth (in./mm)	9.88/251	9.88/251	9.88/251
Weight (lb./kg)	105/48	105/48	125/57

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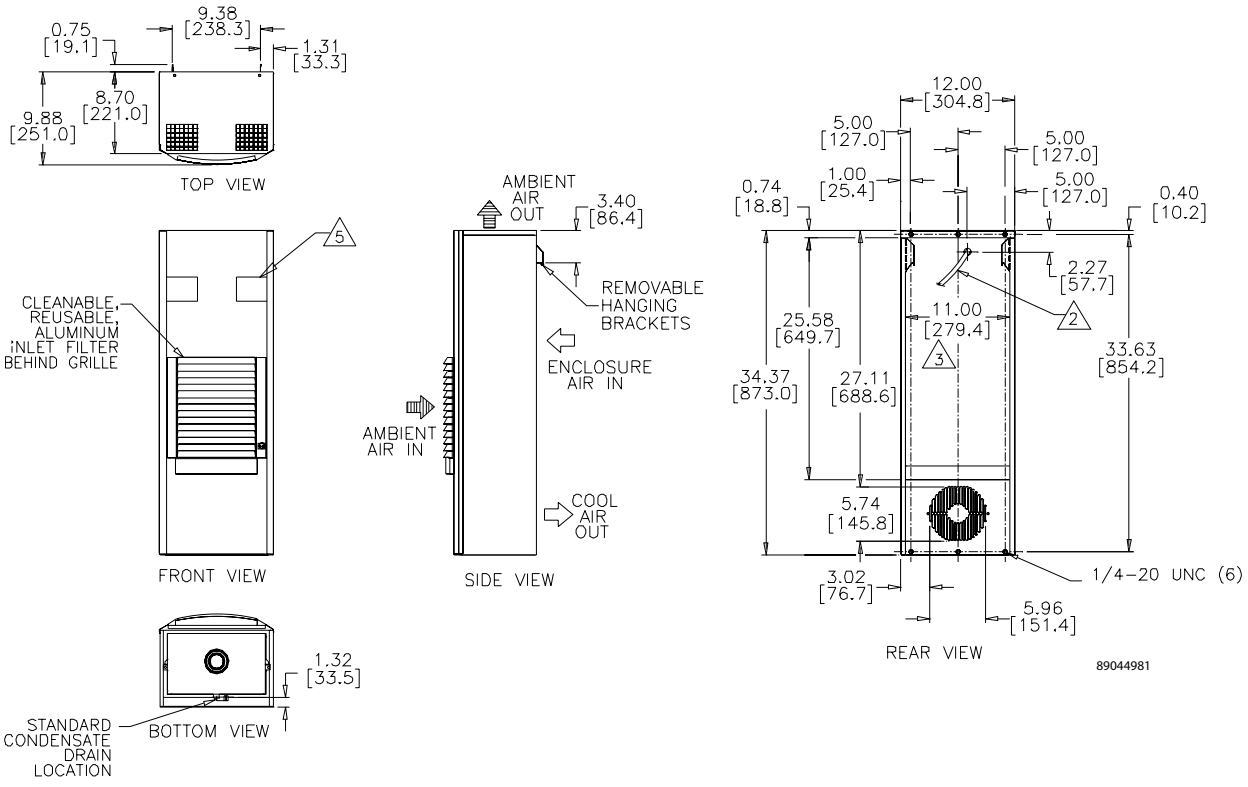
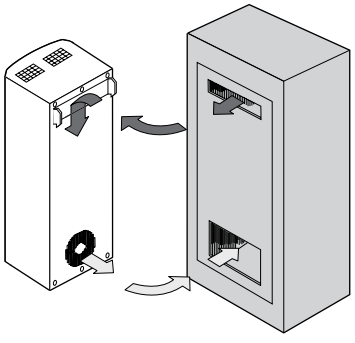
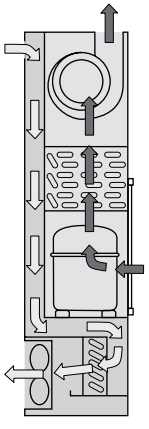
M33 Models 4000 BTU/Hr. (1172 Watt)

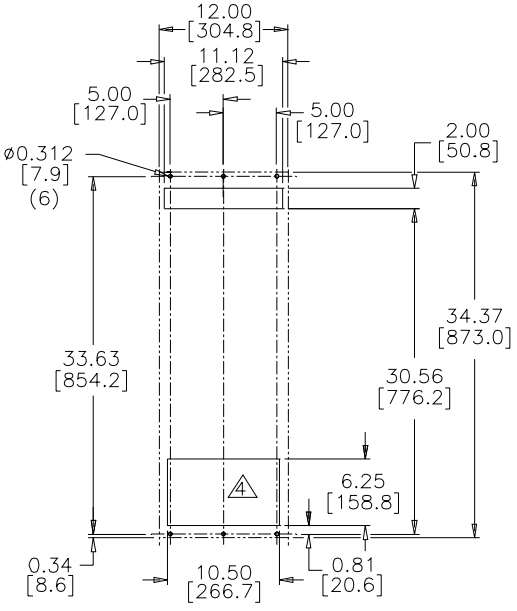




Side-Mount to Enclosure



33NSM Series



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Performance Data **M36 Models 6000 BTU/Hr. (1760 Watt)**

MODEL NUMBER	M36-0616-G307	M36-0626-G306	M36-0646-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**5000/6000**	**5000/6000**	**5000/6000**
Watts	**1465/1760**	**1465/1760**	**1465/1760**
Refrigerant	R-407C	R-407C	R-407C
Refrigerant Charge (ounces/grams)	18/510	18/510	18/510
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	230/391	230/391	230/391
External loop 50 Hz (CFM/M^3/Hr.)	218/370	218/370	218/370
Internal loop 60 Hz (CFM/M^3/Hr.)	260/442	260/442	260/442
External loop 60 Hz (CFM/M^3/Hr.)	245/416	245/416	245/416
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1150	1150	1288
Max. Nominal Current (Amps at 50/60 Hz)	10	5	2.8
Starting Current (Amps)	36.2	17.7	9
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12 Standard		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Behind Filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	60 dBA		
UNIT CONSTRUCTION			
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat RAL 7042 Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	38.72/984	38.72/984	38.72/984
Width (in./mm)	15/381	15/381	15/381
Depth (in./mm)	11.33/288	11.33/288	11.33/288
Weight (lb./kg)	120/54	120/54	140/64

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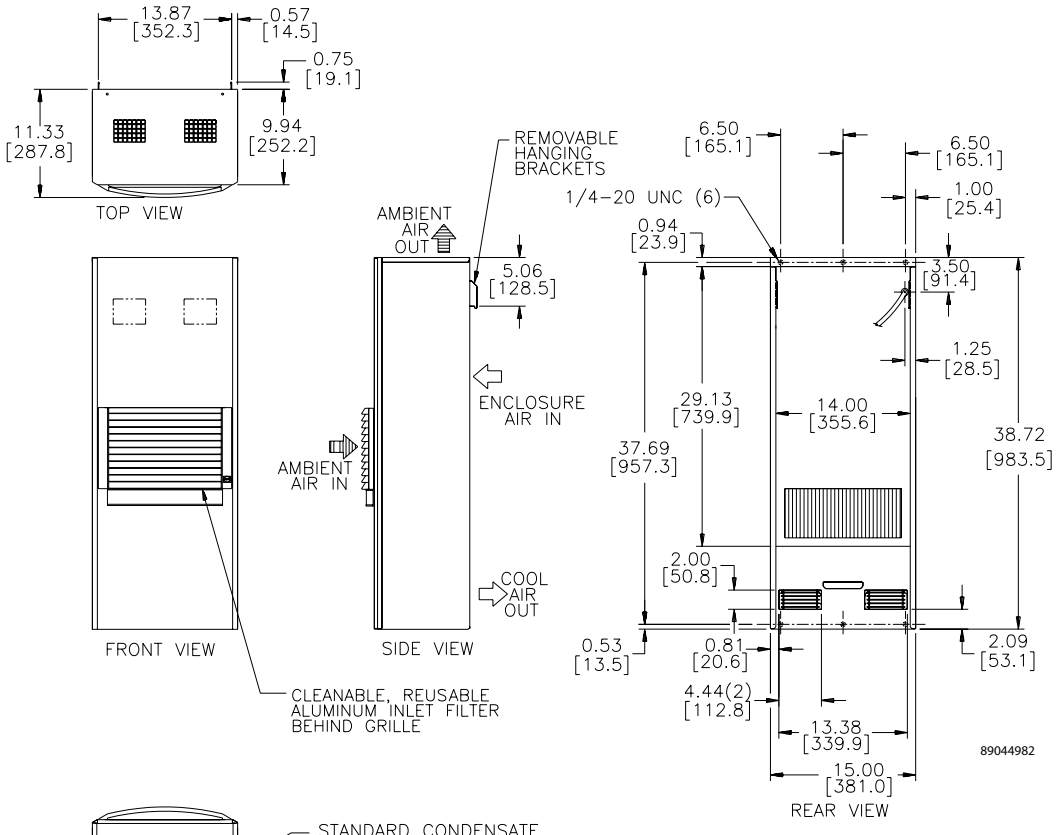
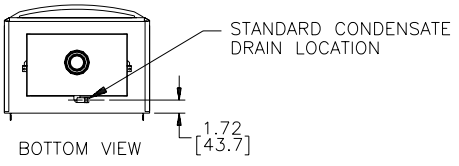
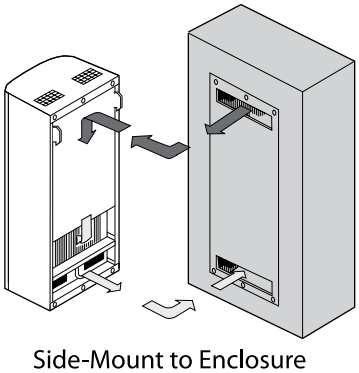
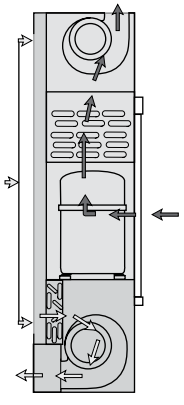
M36 Models 6000 BTU/Hr. (1760 Watt)



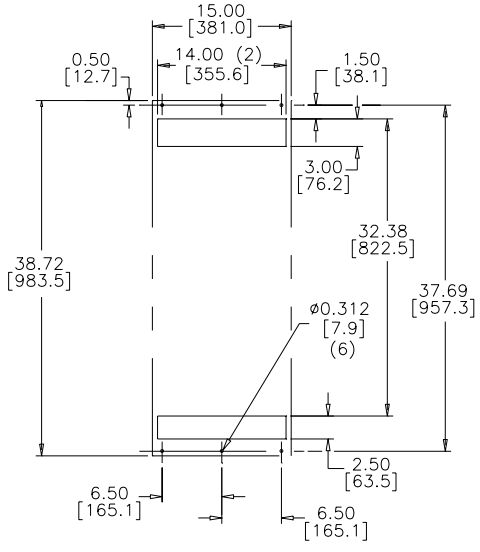




Side-Mount to Enclosure



36N Series



Cutout Instructions

NOTES:
1. SERVICE CORD IS ROUTED THROUGH 3.00 X 14.00 RETURN AIR OPENING.
2. DASHED LINES REPRESENT AIR CONDITIONER.
3. CUT-OUT DIMENSIONS FOR STANDARD UNITS ONLY.

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GENESIS®

Performance Data **M52-3 Phase Models 4100-10000 BTU/Hr. (1113-2930 Watt)**

MODEL NUMBER	M52-0446-G002	M52-0646-G002	M52-0846-G002	M52-1046-G002
COOLING PERFORMANCE				
Nominal:				
BTUs/Hr.	**3800/4100**	**5000/6000**	**6500/7500**	**8000/10000**
Watts	**1113/1201**	**1465/1760**	**1905/2198**	**2345/2930**
Refrigerant	R-134A	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	14/397	17/482	13.5/382	29/824
Operating Temperature Range:				
Maximum (°F/°C)	131/55	125/52	131/55	131/55
Minimum (°F/°C)	50/10	50/10	50/10	50/10
Air Flow at 0 Static Pressure:				
Internal loop 50 Hz (CFM/M^3/Hr.)	225/382	225/382	225/382	225/382
External loop 50 Hz (CFM/M^3/Hr.)	500/850	500/850	500/850	500/850
Internal loop 60 Hz (CFM/M^3/Hr.)	270/459	270/459	248/421	266/452
External loop 60 Hz (CFM/M^3/Hr.)	578/982	578/982	578/982	578/982
ELECTRICAL DATA				
Rated Voltage	*** 400/440/460 3~**	*** 400/440/460 3~**	*** 400/440/460 3~**	*** 400/440/460 3~**
Frequency (Hz)	50/60	50/60	50/60	50/60
Operating Range	* Min./Max. +/- 10%	* Min./Max. +/- 10%	* Min./Max. +/- 10%	* Min./Max. +/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	705.5/782	830/828	1453/1472	1536/1564
Max. Nominal Current (Amps at 50/60 Hz)	1.7	2.0/1.8	3.5/3.2	3.7/3.4
Starting Current (Amps)	15.4	15.4	20	26
Agency Approvals	cUL Listed CE Others available upon request		cUL Listed CE Others available upon request	
Power Input Description	Terminal Block		Terminal Block	
ENCLOSURE PROTECTION				
UL Type	Type 12 Standard			
CONTROLLER				
Description	Basic Mechanical Thermostat			
Thermostat Location	Behind Filter			
Factory Thermostat Setting (°F/°C)	80/27			
SOUND LEVEL				
At 1.5 Meters	67dBA			
UNIT CONSTRUCTION				
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional			
Finish	Powder Coat RAL 7042 Gray Standard			
UNIT DIMENSIONS				
Height (in./mm)	52.63/1337	52.63/1337	52.63/1337	52.63/1337
Width (in./mm)	17.13/435	17.13/435	17.13/435	17.13/435
Depth (in./mm)	11.33/288	11.33/288	11.33/288	13.33/339
Weight (lb./kg)	162/74	162/74	162/74	165/75

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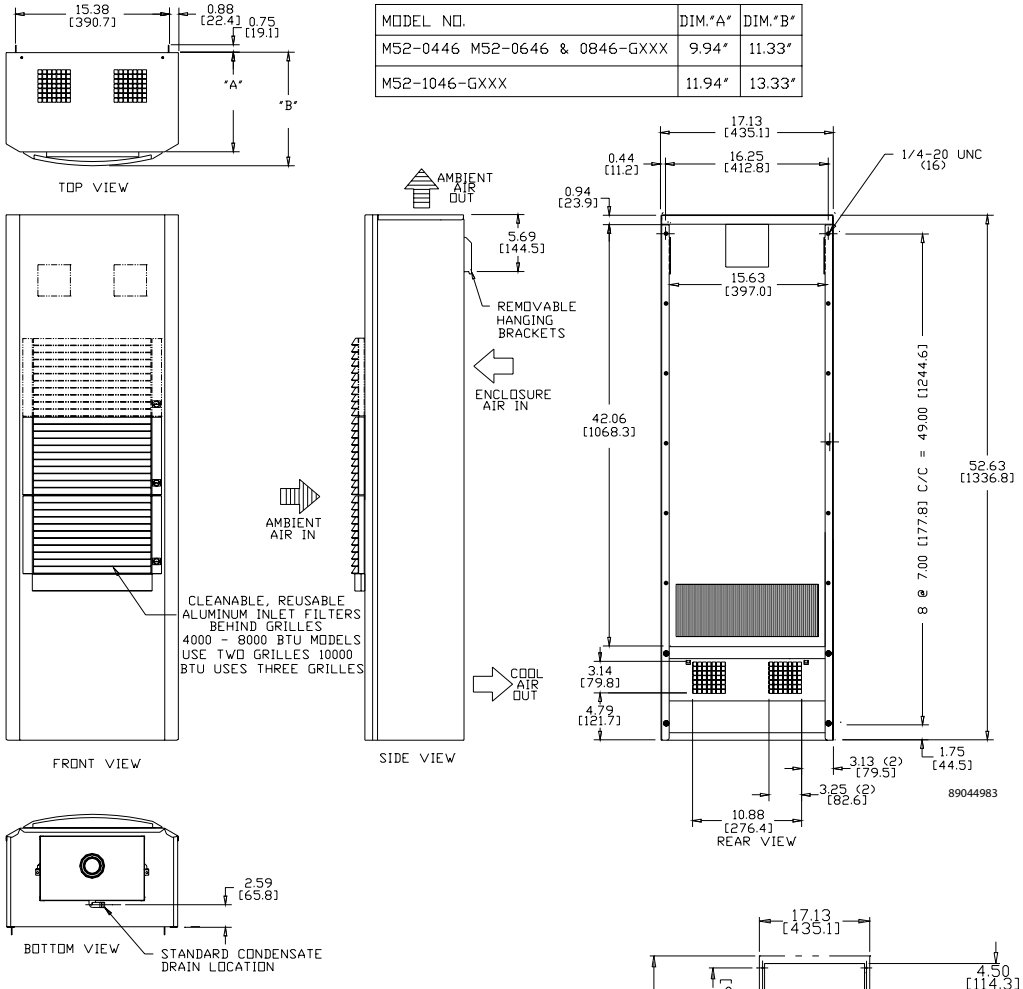
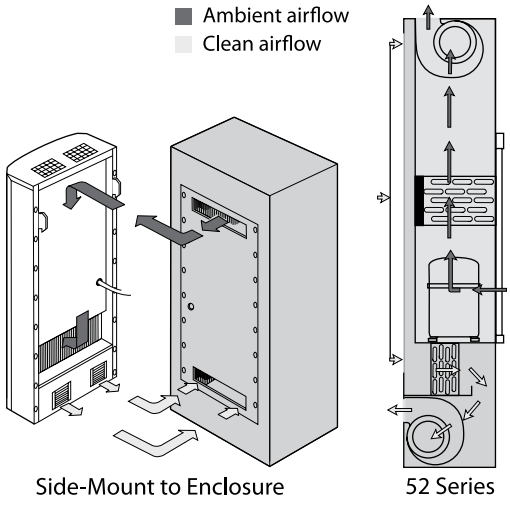
M52-3 Phase Models 4100-10000 BTU/Hr. (1201-2930 Watt)

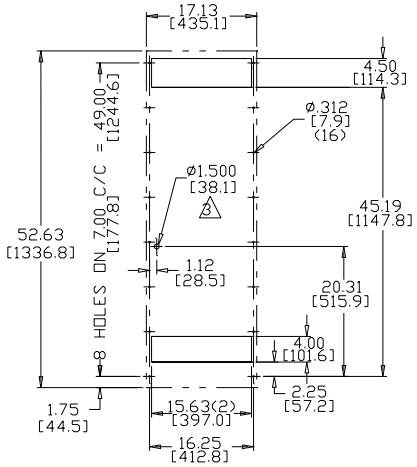
MODEL NO.	DIM."A"	DIM."B"
M52-0446 M52-0646 & 0846-GXXX	9.94"	11.33"
M52-1046-GXXX	11.94"	13.33"





Side-Mount to Enclosure

52 Series



Cutout Instructions

NOTES:
1. DASHED LINES REPRESENT AIR CONDITIONER.
2. CUT-OUT DIMENSIONS FOR STANDARD UNITS ONLY.
3. THIS HOLE MAY BE DELETED IF THE SERVICE CORD IS ROUTED THROUGH THE 4.50" X 15.63" OPENING. (EXCEPT UNITS WITH ELECTRIC HEAT)

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Notes

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GENESIS®
Top-Mount Air Conditioner

MHB11 Model

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The perfect cooling solution when side-mount air conditioning is not an option

GENESIS® Top-Mount Air Conditioner

PRODUCT OVERVIEW

The perfect temperature control solution when you don't have room to hang a cooling unit on the side of your electrical enclosure.

APPLICATIONS

- Industrial drive enclosures
- Automotive assembly systems
- Material handling applications
- Other process control systems

GENESIS Chapter Contents

GENESIS® Top-Mount Air Conditioners . . 88
MHB11 Models 2200 BTU. 89
MHB11 Models 4000 BTU 90

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Top-Mount Air Conditioners

Industry Standards

UL/cUL Listed, CE, others available upon request

- Type 12

Application

- Industrial automation
- Package handling equipment
- Security and defense systems
- Ideal for use where there is little or no clearance around the enclosure

Features

- Robust reciprocating compressor
- R134a earth-friendly refrigerant and RoHS compliant
- Models for 115, 230 and 460 single-phase AC volt power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from 50 F/10 C to 125 F/52 C
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat located behind the filter of the unit. Indoor Air Conditioner models include digital display on ambient side.
- Low-carbon mild-steel sheet-metal cover for rugged factory environments
- Cleanable, reusable aluminum mesh filter to protect coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Indoor Air Conditioner models also include:
  - Electro-Mechanical Thermostat
  - Surge Suppressor
  - Condensate Management System

Finish

- RAL 7042 gray powder-coat paint in a semi-gloss finish
- Other colors and textures available

Options

- Thermostat Malfunction Package
- Special Voltage Package
  * Consult the factory for availability and catalog number

Notes

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Performance Data **MHB11 Models 2200 BTU/Hr. (645 Watt)**

MODEL NUMBER	MHB11-0216-G306	MHB11-0226-G306	MHB11-0246-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**2200/2200**	**2200/2200**	**2200/2200**
Watts	**645/645**	**645/645**	**645/645**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	11/312	11/312	11/312
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	158/268	170/289	170/289
External loop 50 Hz (CFM/M^3/Hr.)	222/377	218/370	218/370
Internal loop 60 Hz (CFM/M^3/Hr.)	177/301	192/326	192/326
External loop 60 Hz (CFM/M^3/Hr.)	252/428	245/416	245/416
ELECTRICAL DATA			
Rated Voltage	**115**	**220/230**	**440/460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1127/1035	1210/1058	1320/1150
Max. Nominal Current (Amps at 50/60 Hz)	9.8/9.0	5.5/4.6	3.0/2.5
Starting Current (Amps)	28	14.4	7.4
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12 Standard		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Behind Filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	62dBA		
UNIT CONSTRUCTION			
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat RAL 7042 Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	10.25/260	10.25/260	10.25/260
Width (in./mm)	17/432	17/432	17/432
Depth (in./mm)	21.08/535	21.08/535	21.08/535
Weight (lb./kg)	90/41	90/41	110/50

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Performance Data **MHB11 Models 4000 BTU/Hr. (1172 Watt)**

MODEL NUMBER			
	MHB11-0416-G307	MHB11-0426-G306	MHB11-0446-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**3300/4000**	**3300/4000**	**3300/4000**
Watts	**967/1172**	**967/1172**	**967/1172**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	13/369	13/369	13/369
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	158/268	170/289	170/289
External loop 50 Hz (CFM/M^3/Hr.)	222/377	218/370	218/370
Internal loop 60 Hz (CFM/M^3/Hr.)	177/301	192/326	192/326
External loop 60 Hz (CFM/M^3/Hr.)	252/428	245/416	245/416
ELECTRICAL DATA			
Rated Voltage	**110/115**	**220/230**	**440/460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1617/1564	1760/1725	1936/1886
Max. Nominal Current (Amps at 50/60 Hz)	14.7/13.6	8.0/7.5	4.4/4.1
Starting Current (Amps)	48	23	12
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12 Standard		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Behind Filter		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	62dBA		
UNIT CONSTRUCTION			
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat RAL 7042 Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	10.25/260	10.25/260	10.25/260
Width (in./mm)	17/432	17/432	17/432
Depth (in./mm)	21.08/535	21.08/535	21.08/535
Weight (lb./kg)	108/49	108/49	128/58

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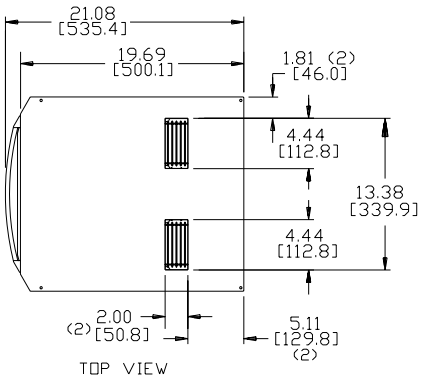
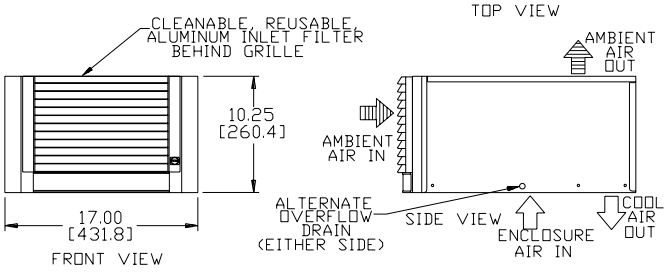
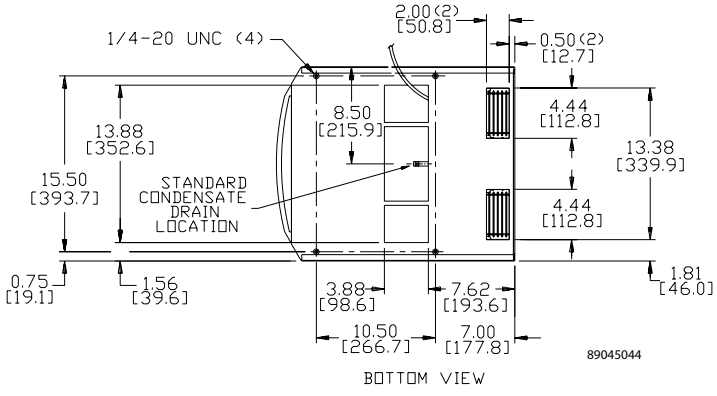
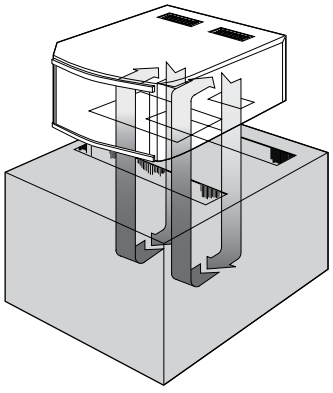
MHB11 Models 2200-4000 BTU/Hr. (645-1172 Watt)

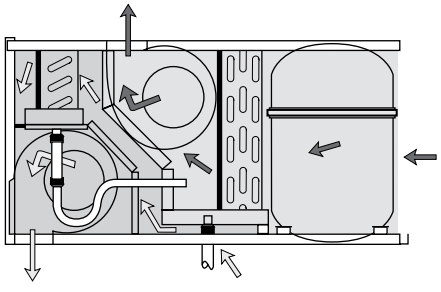


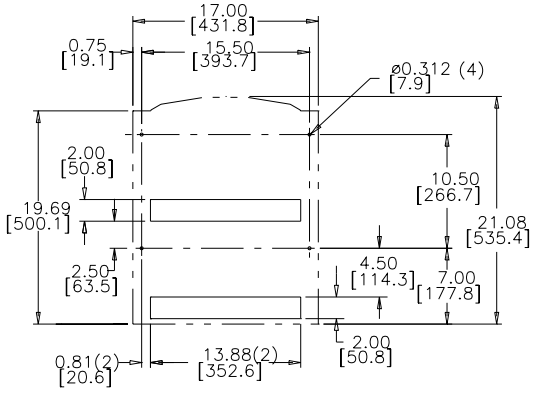






Top-Mount to Enclosure





Cutout Instructions

NOTES:
1. DASHED LINES REPRESENT AIR CONDITIONER.
2. CUT–OUT DIMENSIONS FOR STANDARD UNITS ONLY.

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PROAIR™
Harsh Environment / Wash Down Air Conditioner

CR23

CR23st

CR43st

CR29

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The ultimate in protective cooling for food & beverage, wastewater & other applications

PROAIR™ Harsh Environment / Wash Down Air Conditioner

PRODUCT OVERVIEW

Available in stainless steel and painted galvanized sheet metal options, the PROAIR™ Air Conditioner is engineered tough to seal out high-pressure hose water and withstand corrosive atmospheres.

APPLICATIONS

- Food and beverage process controls
- Wastewater treatment systems
- Other harsh environment applications

PROAIR Harsh Environment/ Wash Down Chapter Contents

Harsh Environment / Wash Down Air Conditioners 94
CR23 Model 95
CR29 Model 98
CR43 Model 101

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Harsh Environment / Wash Down Air Conditioners

CR23
1600 BTU/Hr.
469 Watt

CR29
2200 and 4000 BTU/Hr.
645 and 1172 Watts

CR43
6000 & 8000 BTU/Hr.
1758 and 2344 Watts

Industry Standards

UL/cUL Listed or UR/cUR Recognized, CE, others available upon request

- Type 12/3R/4
- Type 4X stainless steel option

Application

- Industrial automation
- Package handling equipment
- Food and beverage
- Wastewater treatment
- Security and defense systems
- And more

Features

- Robust reciprocating compressor
- Maintenance made easy by front cover hinging open for quick access to all components; condenser coil can be cleaned while unit is still mounted to the cabinet
- R134a or R407c earth-friendly refrigerant and RoHS compliant
- Models for 115, 230 and 460 single phase AC volt power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from -40 F/-40 C to 131 F/55 C (with optional low-ambient package)
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat located behind the filter of the unit. Indoor Air Conditioner models include digital display on ambient side.
- Low-carbon mild-steel sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cleanable reusable aluminum mesh filter to protect coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- High-performance fans and blowers designed for densely packed enclosures
- Standard Indoor Air Conditioner models also include:
  - Electro-Mechanical Thermostat
  - Surge Suppressor

Finish

- ANSI 70 gray powder-coat paint in a semi-gloss finish
- Stainless Steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

Options

- Thermostat Malfunction Package
- Special Voltage Package
- Outdoor Package*
- Harsh Environment Package*
- Stainless Steel Package*
- Heater Package*

* T-Series may be more appropriate. Refer to T-Series A/C chapter. Consult the factory for availability and catalog number.

Notes

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Performance Data **CR23 Models 1600 BTU/Hr. (469 Watt)**

MODEL NUMBER	CR23-0216-G002	CR23-0226-G002	CR23-0246-G400
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**1400/1600**	**1400/1600**	**1400/1600**
Watts	**410/469**	**410/469**	**410/469**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	10/284	10/284	10/284
Operating Temperature Range:			
Maximum (°F/°C)	131/55	131/55	131/55
Minimum (°F/°C) (Low Ambient Pkg)	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M3/Hr.)	117/199	117/199	117/199
External loop 50 Hz (CFM/M3/Hr.)	86/146	86/146	86/146
Internal loop 60 Hz (CFM/M3/Hr.)	130/221	130/221	130/221
External loop 60 Hz (CFM/M3/Hr.)	95/161	95/161	95/161
ELECTRICAL DATA			
Rated Voltage	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	471.5/517.5	506	552
Max. Nominal Current (Amps at 50/60 Hz)	4.1/4.5	2.2	1.2
Starting Current (Amps)	18	8.5	5
Agency Approvals	cUL Listed CE		cUR Recognized CE
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type	Type 12/3R Standard 4/4X Stainless Steel Optional		
CONTROLLER			
Description	Basic Mechanical Thermostat		
Thermostat Location	Behind Cover		
Factory Thermostat Setting (°F/°C)	80/27		
SOUND LEVEL			
At 1.5 Meters	62 dBA		
UNIT CONSTRUCTION			
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat ANSI 70 Gray Standard		
UNIT DIMENSIONS			
Height (in./mm)	23/584	23/584	23/584
Width (in./mm)	10/254	10/254	10/254
Depth (in./mm)	8.75/222	8.75/222	8.75/222
Weight (lb./kg)	57/26	57/26	67/30

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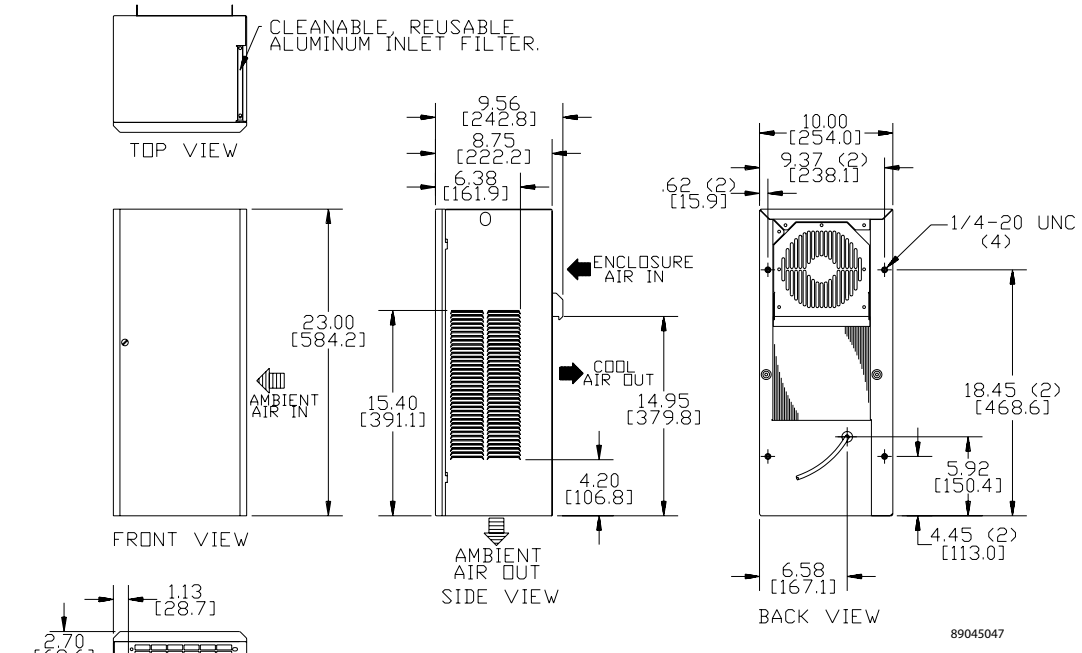
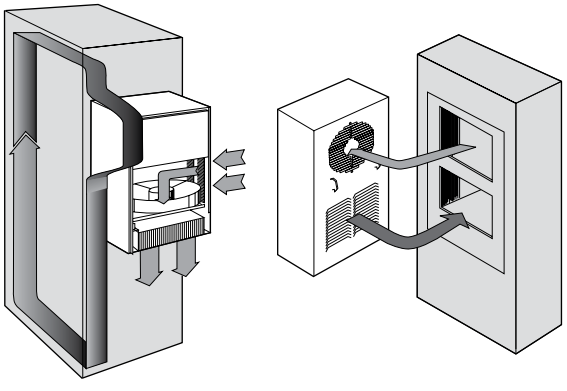
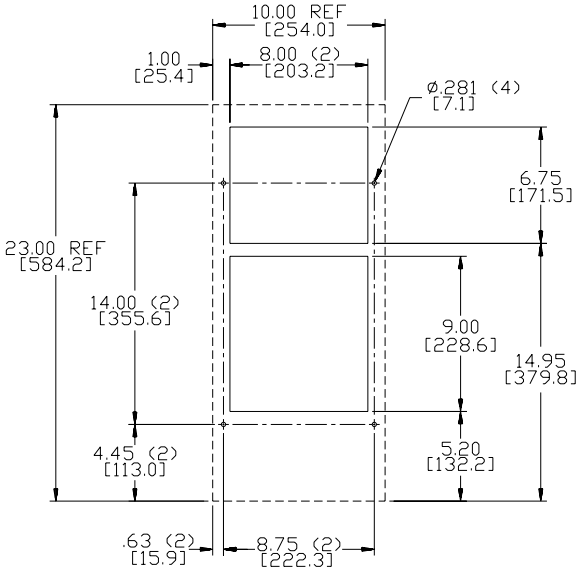
CR23 Models 1600 BTU/Hr. (469 Watt)







Cutout Instructions

NOTE:
1. DASHED LINES REPRESENT OUTSIDE OF AIR CONDITIONER.

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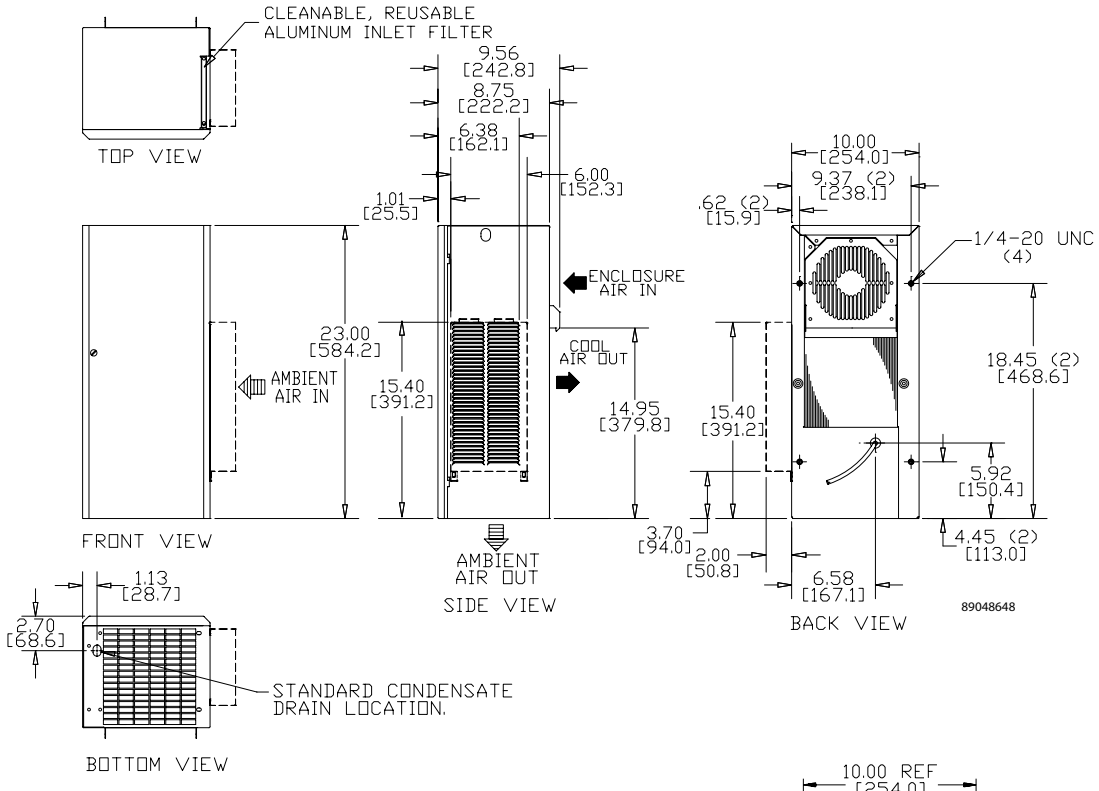
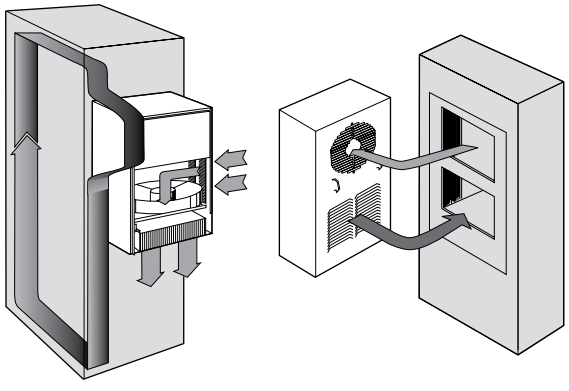
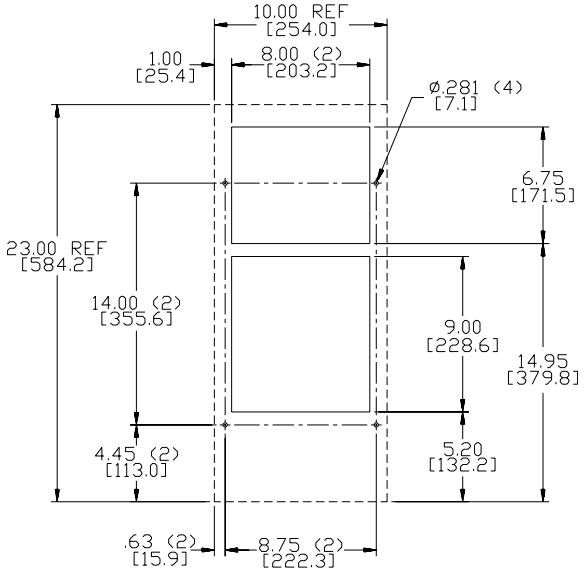
CR23 Models 1600 BTU/Hr. (469 Watt) With 4X Hood







Cutout Instructions

NOTE:

1. DASHED LINES REPRESENT OUTSIDE OF AIR CONDITIONER.

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Performance Data **CR29 Models 2200-4000 BTU/Hr. (645-1172 Watt)**

MODEL NUMBER	CR29-0216-G002	CR29-0226-G002	CR29-0246-G400	CR29-0416-G002	CR29-0426-G002	CR29-0446-G400
COOLING PERFORMANCE						
Nominal:						
BTUs/Hr.	**2000/2200**	**2500/2700**	**2500/2700**	**3500/4000**	**3500/4000**	**3500/4000**
Watts	**586/645**	**732/791**	**732/791**	**1025/1172**	**1025/1172**	**1026/1172**
Refrigerant	R-134A	R-134A	R-134A	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	11/312	11/312	11/312	12/341	12/341	12/341
Operating Temperature Range:						
Maximum (°F/°C)	131/55	131/55	131/55	131/55	131/55	131/55
Minimum (°F/°C) (Low Ambient Pkg)	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:						
Internal loop 50 Hz (CFM/M3/Hr.)	141/239	141/239	141/239	141/239	141/239	141/239
External loop 50 Hz (CFM/M3/Hr.)	235/399	235/399	235/399	235/399	235/399	235/399
Internal loop 60 Hz (CFM/M3/Hr.)	157/266	157/266	157/266	157/266	157/266	157/266
External loop 60 Hz (CFM/M3/Hr.)	261/443	261/443	261/443	261/443	261/443	261/443
ELECTRICAL DATA						
Rated Voltage	**115**	**230**	**460V 1PH**	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	851/517.5	1058/877	1150/966	1552.5	1541/1518	1702/1656
Max. Nominal Current (Amps at 50/60 Hz)	7.4	4.6/3.9	2.5/2.1	13.5/13.5	6.7/6.6	3.7/3.6
Starting Current (Amps)	28	14.4	7.4	48	23	12
Agency Approvals	cUL Listed CE		cUR Recognized CE	cUL Listed CE		cUR Recognized CE
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION						
UL Type	Type 12/3R Standard 4/4X Stainless Steel Optional			Type 12/3R Standard 4/4X Stainless Steel Optional		
CONTROLLER						
Description	Basic Mechanical Thermostat			Basic Mechanical Thermostat		
Thermostat Location	Behind Cover			Behind Cover		
Factory Thermostat Setting (°F/°C)	80/27			80/27		
SOUND LEVEL						
At 1.5 Meters	68 dBA			68 dBA		
UNIT CONSTRUCTION						
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional			Mild Steel Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat ANSI 70 Light-Gray Standard			Powder Coat ANSI 70 Light-Gray Standard		
UNIT DIMENSIONS						
Height (in./mm)	29.5/749	29.5/749	29.5/749	29.5/749	29.5/749	29.5/749
Width (in./mm)	15.75/400	15.75/400	15.75/400	15.75/400	15.75/400	15.75/400
Depth (in./mm)	8.63/219	8.63/219	8.63/219	8.63/219	8.63/219	8.63/219
Weight (lb./kg)	98/44	98/44	108/49	118/54	118/54	128/58

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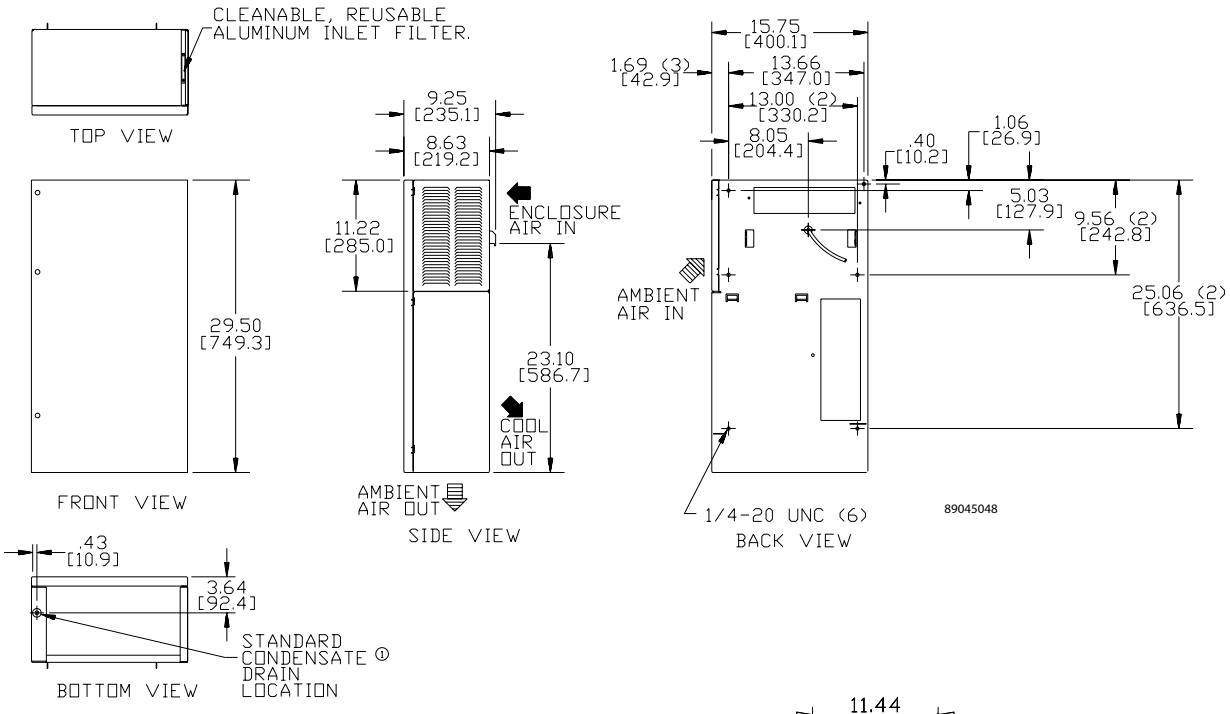
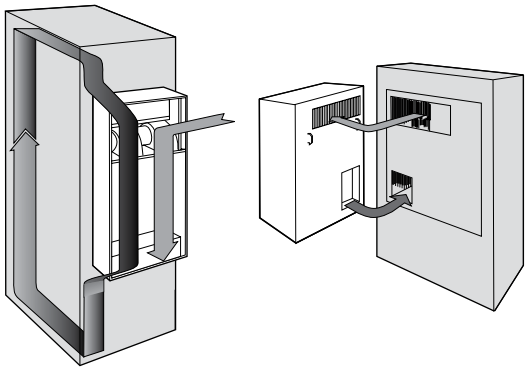
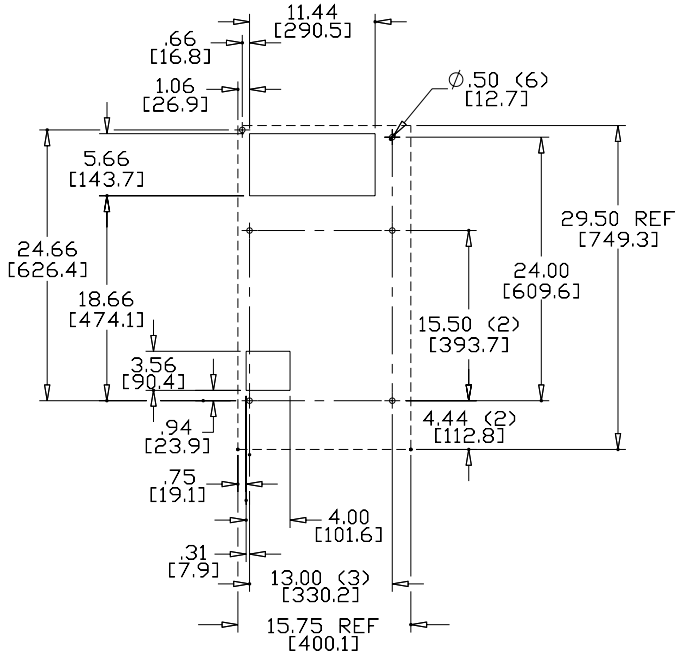
CR29 Models 2200-4000 BTU/Hr. (645-1172 Watt)







Cutout Instructions

NOTE:
1. DASHED LINES REPRESENT OUTSIDE OF AIR CONDITIONER.

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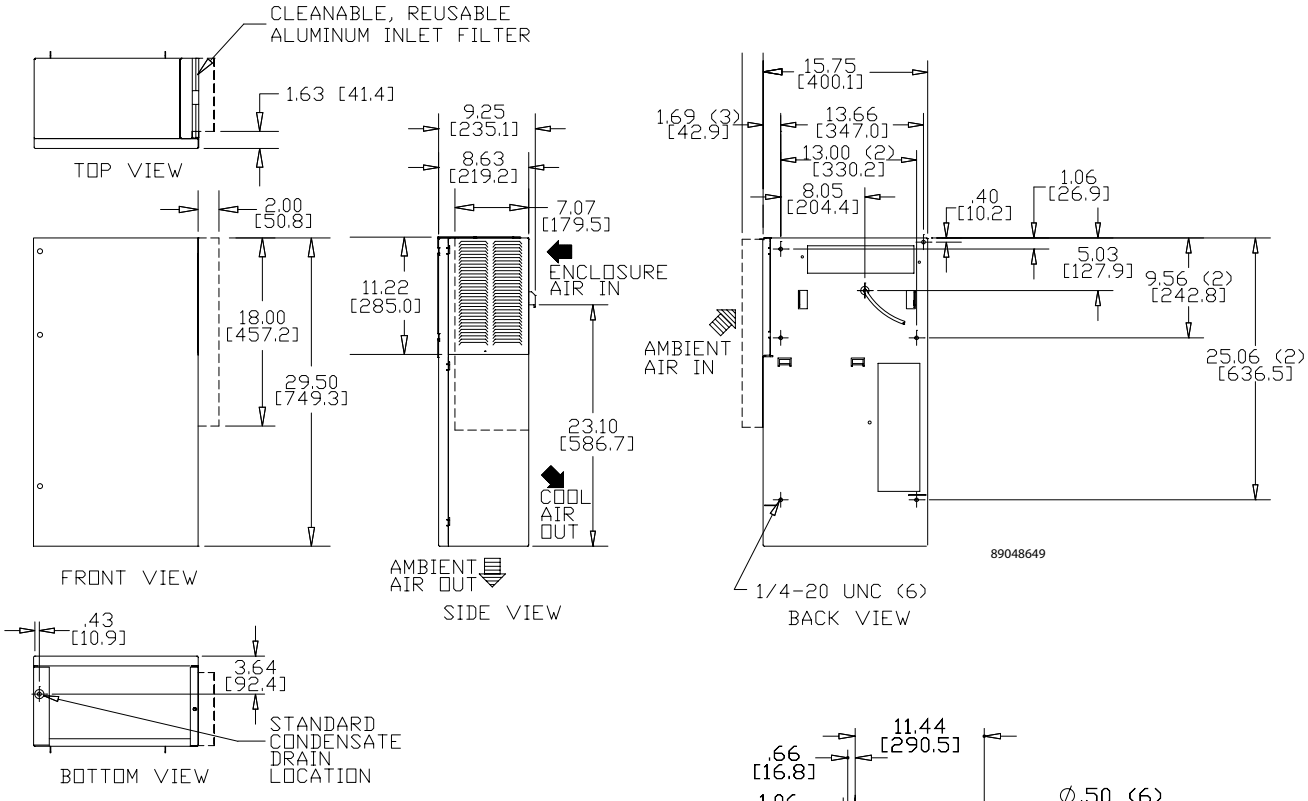
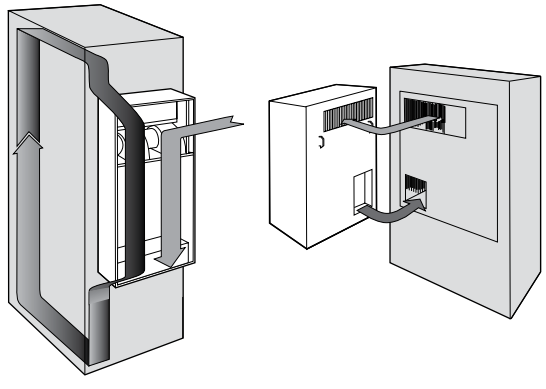
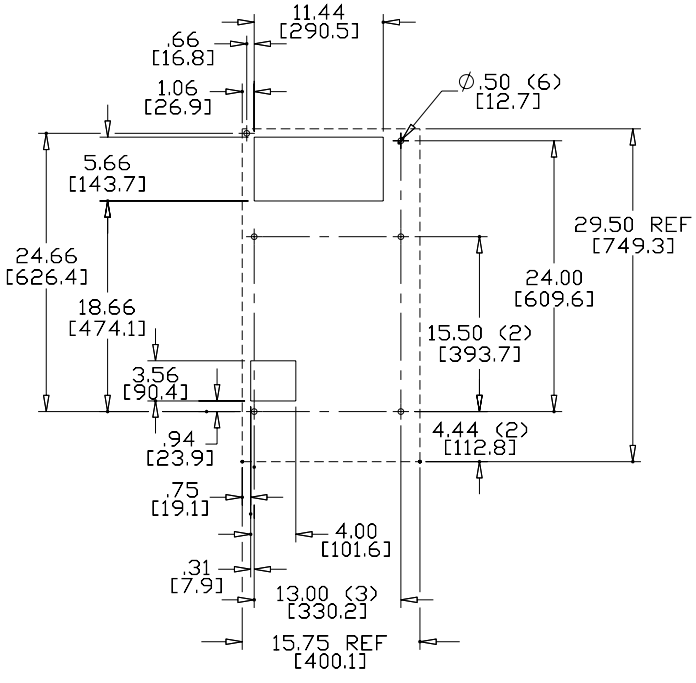
CR29 Models 2200-4000 BTU/Hr. (645-1172 Watt) With 4X Hood







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Performance Data **CR43 Models 6000-8000 BTU/Hr. (1758-2344 Watt)**

MODEL NUMBER	CR43-0616-G002	CR43-0626-G002	CR43-0646-G400	CR43-0816-G002	CR43-0826-G002	CR43-0846-G400
COOLING PERFORMANCE						
Nominal:						
BTUs/Hr.	**5500/6000**	**5500/6000**	**5500/6000**	**7100/8000**	**7100/8000**	**7100/8000**
Watts	1611/1758	**1611/1758**	**1611/1758**	**2080/2344**	**2080/2344**	**2080/2344**
Refrigerant	R-134A	R-134A	R-134A	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	19/538	19/538	19/538	19/538	19/538	19/538
Operating Temperature Range:						
Maximum (°F/°C)	131/55	131/55	131/55	131/55	131/55	131/55
Minimum (°F/°C) (Low Ambient Pkg.)	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:						
Internal loop 50 Hz (CFM/M^3/Hr.)	320/543	226/384	226/384	320/543	226/384	226/384
External loop 50 Hz (CFM/M^3/Hr.)	480/815	470/798	470/798	480/815	470/798	470/798
Internal loop 60 Hz (CFM/M^3/Hr.)	368/625	255/433	255/433	368/625	255/433	255/433
External loop 60 Hz (CFM/M^3/Hr.)	544/924	540/917	540/917	544/924	540/917	540/917
ELECTRICAL DATA						
Rated Voltage	**115**	**230**	**460V 1PH**	**115**	**230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1460	1403/1518	1426/1564	1460	1403/1518	1426/1564
Max. Nominal Current (Amps at 50/60 Hz)	12.7	6.1/6.6	3.4/3.6	12.7	6.1/6.6	3.4/3.6
Starting Current (Amps)	48.3	27	14	48.3	27	14
Agency Approvals	cUL Listed CE Others available upon request		cUR Recognized CE	cUL Listed CE Others available upon request		cUR Recognized CE
Power Input Description	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire leads	NEMA 5-20 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire leads
ENCLOSURE PROTECTION						
UL Type	Type 12/3R Standard 4/4X Stainless Steel Optional			Type 12/3R Standard 4/4X Stainless Steel Optional		
CONTROLLER						
Description	Basic Mechanical Thermostat			Basic Mechanical Thermostat		
Thermostat Location	Enclosure Side on All Base Models			Enclosure Side on All Base Models		
Factory Thermostat Setting (°F/°C)	80/27			80/27		
SOUND LEVEL						
At 1.5 Meters	71 dBA			71 dBA		
UNIT CONSTRUCTION						
Material	Galvanized Sheet Metal Standard Stainless Steel Optional			Galvanized Sheet Metal Standard Stainless Steel Optional		
Finish	Powder Coat ANSI 70 Light Gray Standard			Powder Coat ANSI 70 Light Gray Standard		
UNIT DIMENSIONS						
Height (in./mm)	43.31/1100			43.31/1100		49.75/1263.62
Width (in./mm)	15.75/400			15.75/400		15.75/400
Depth (in./mm)	10.25/260			10.25/260		10.25/260
Weight (lb./kg)	125/57	125/57	155/70	125/57	125/57	155/70

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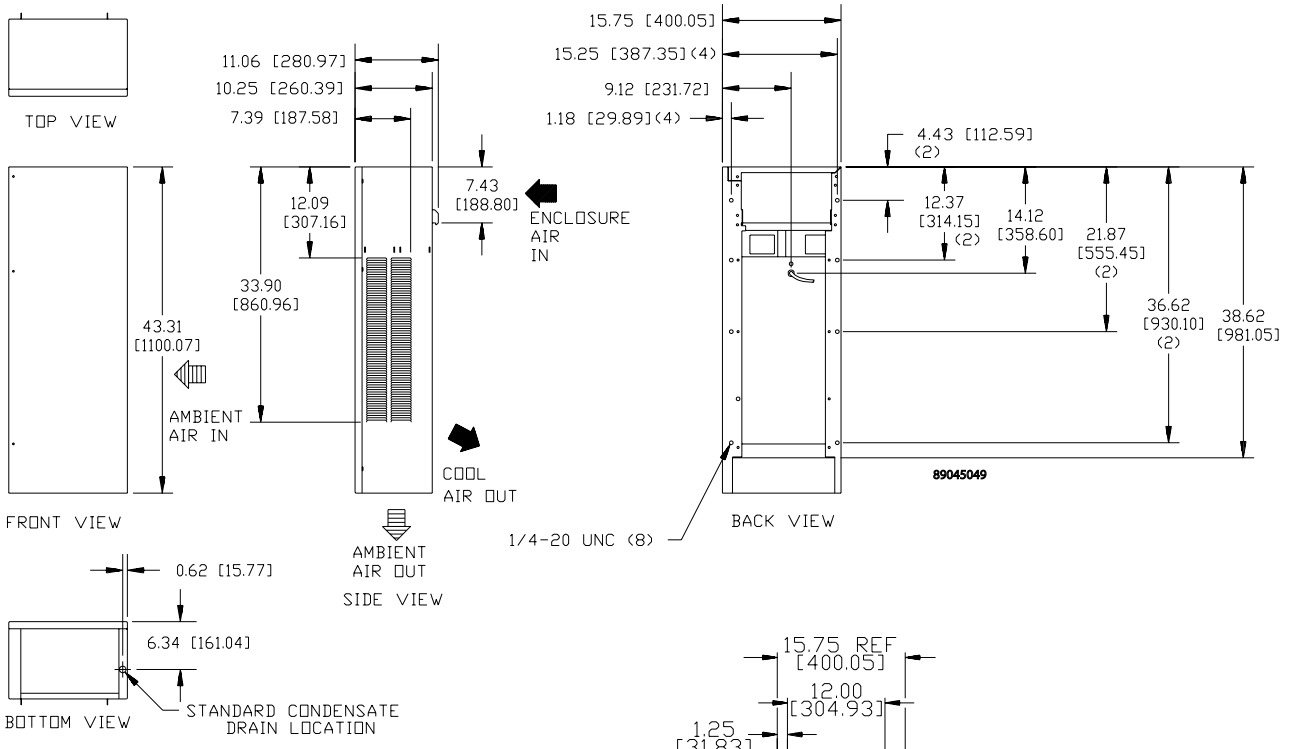
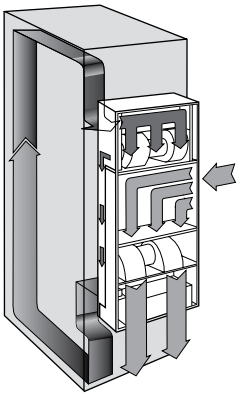
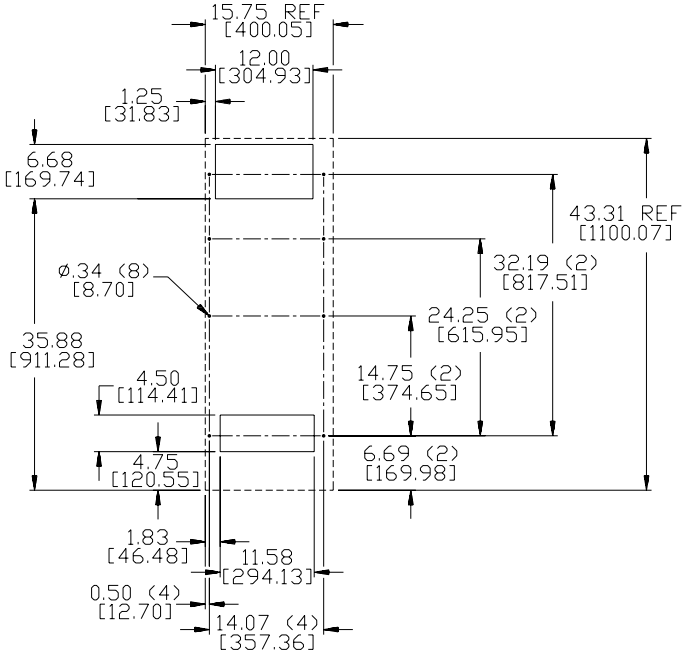
CR43 Models 6000-8000 BTU/Hr. (1758-2344 Watt)







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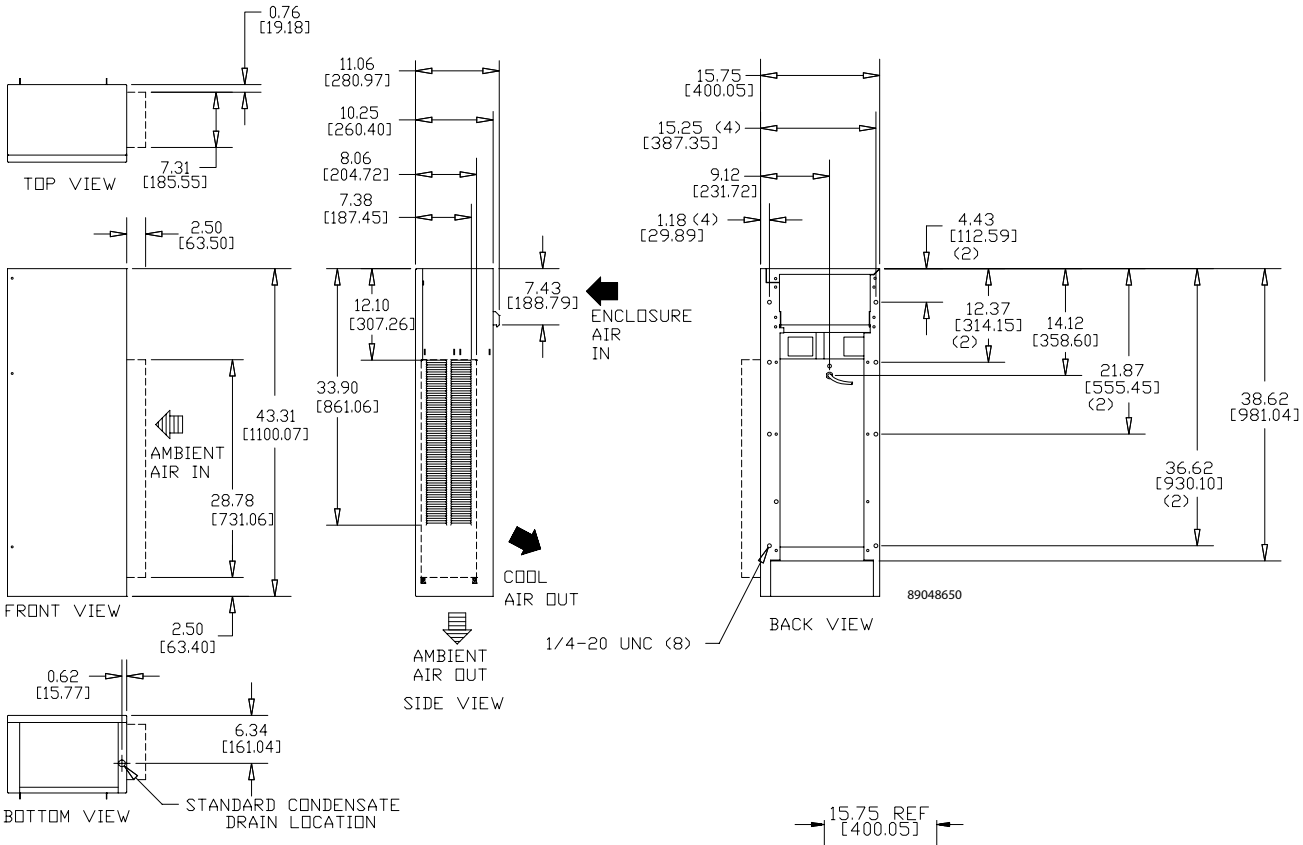
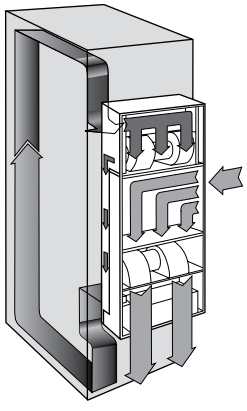
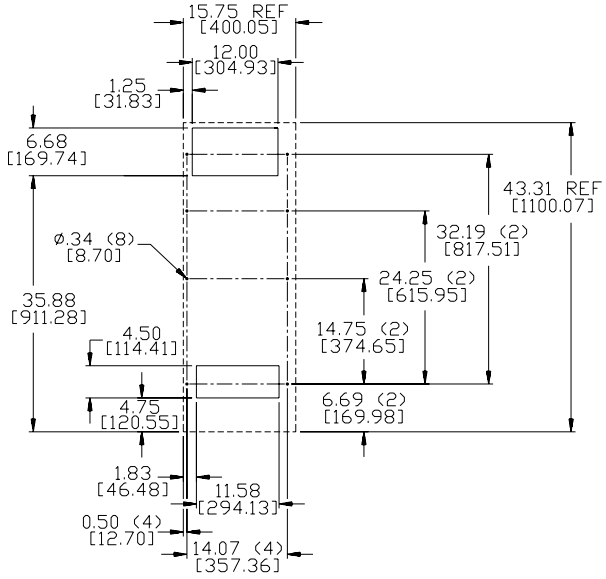
CR43 Models 6000-8000 BTU/Hr. (1758-2344 Watt) With 4X Hood







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Water-Cooled Air Conditioners

33WC Model

CR43WC Model

LB11WC Model

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Effective electronics cooling for hot, dirty and hostile environments

Water-Cooled Air Conditioners

PRODUCT OVERVIEW

For highly effective temperature control when the electrical enclosure is in a hot, dirty or hostile environment. Requires chilled water at the enclosure.

APPLICATIONS

- High-temperature environments
- Extremely dusty and dirty conditions
- Other demanding applications

Water-Cooled Chapter Contents

Water-Cooled Air Conditioners 106
33WC Model..... 107
CR43 Model 109
LB11WC Model.....111

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Water-Cooled Air Conditioners

33WC
4000 BTU/Hr.
(1172 Watt) Models

CR43WC
8000 BTU/Hr.
(2345 Watt) Models

LB11WC
4000 BTU/Hr.
(1172 Watt) Models

Industry Standards

UL/cUL Listed or UR/cUR Recognized, CE, others available upon request

- Type 12 on 33 water-cooled models
- Type 4/4X stainless steel option on CR water cooled models

Application

- Industrial automation
- Package handling equipment
- Food and beverage
- Wastewater treatment
- Security and defense systems
- Pulp and paper
- And more

Features

- Robust reciprocating compressor
- R134a earth-friendly refrigerant and RoHS compliant
- Models for 115 and 230 AC volt power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from 50 F/10 C to 125 F/52 C
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat located behind the front panel of the unit
- Low-carbon mild-steel sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Heat is removed from the system by means of the water cooling the refrigerant. No external air movers or condenser coils to get clogged.
- Maximum water usage of 2 GPM at 90 F water intake temperature
- Standard Indoor Air Conditioner models also include:
  - Electro-Mechanical Thermostat
  - Surge Suppressor

Finish

- ANSI 70 gray powder-coat paint in a semi-gloss finish
- Stainless steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

Options

- Thermostat Malfunction Package
- Special Voltage Package
- Active Condensate Evaporator Package
- Harsh Environment Package*
- Stainless Steel Package*

* Consult the factory for availability and catalog number.

Notes

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Water Cooled

Performance Data **33WC Models 4000 BTU/Hr. (1172 Watt)**

MODEL NUMBER			
	33-0416-GW010	33-0426-GW014	33-0426-GW012
COOLING PERFORMANCE			
Nominal:			
BTUs/Hr.	**3800/4000**	**3800/4000**	**3800/4000**
Watts	**1113/1172**	**1113/1172**	**1113/1172**
Refrigerant	R-134A	R-134A	R-134A
Refrigerant Charge (ounces/grams)	7/198	7/198	7/198
Operating Temperature Range:			
Maximum (°F/°C)	125/52	125/52	125/52
Minimum (°F/°C)	50/10	50/10	50/10
Air Flow at 0 Static Pressure:			
Internal loop 50 Hz (CFM/M^3/Hr.)	135/229	100/170	100/170
External loop 50 Hz	WATERFLOW: 0.5 GPM @ 90 F	WATERFLOW: 0.5 GPM @ 90 F	WATERFLOW: 0.5 GPM @ 90 F
Internal loop 60 Hz (CFM/M^3/Hr.)	145/246	110/187	110/187
External loop 60 Hz	WATERFLOW: 0.5 GPM @ 90 F	WATERFLOW: 0.5 GPM @ 90 F	WATERFLOW: 0.5 GPM @ 90 F
ELECTRICAL DATA			
Rated Voltage	**115**	**220/230**	**460V 1PH**
Frequency (Hz)	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	600/667	726/736	828/782
Max. Nominal Current (Amps at 50/60 Hz)	6.0/5.8	3.3/3.2	1.8/1.7
Starting Current (Amps)	28	14.4	7.4
Agency Approvals	cUL Listed CE	cUL Listed CE	cUR Recognized CE
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	6-ft. cord with wire terminations
ENCLOSURE PROTECTION			
UL Type		Type 12 Standard	
CONTROLLER			
Description		Basic Mechanical Thermostat	
Thermostat Location		Behind Front cover	
Factory Thermostat Setting (°F/°C)		80/27	
SOUND LEVEL			
At 1.5 Meters		61 dBA	
UNIT CONSTRUCTION			
Material		Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish		Powder Coat RAL 7042 Gray Standard	
UNIT DIMENSIONS			
Height (in./mm)	34.13/867	34.13/867	38.63/981.2
Width (in./mm)	12.38/314	12.38/314	12.38/314
Depth (in./mm)	8.75/222	8.75/222	8.75/222
Weight (lb./kg)	86/39	86/39	106/48

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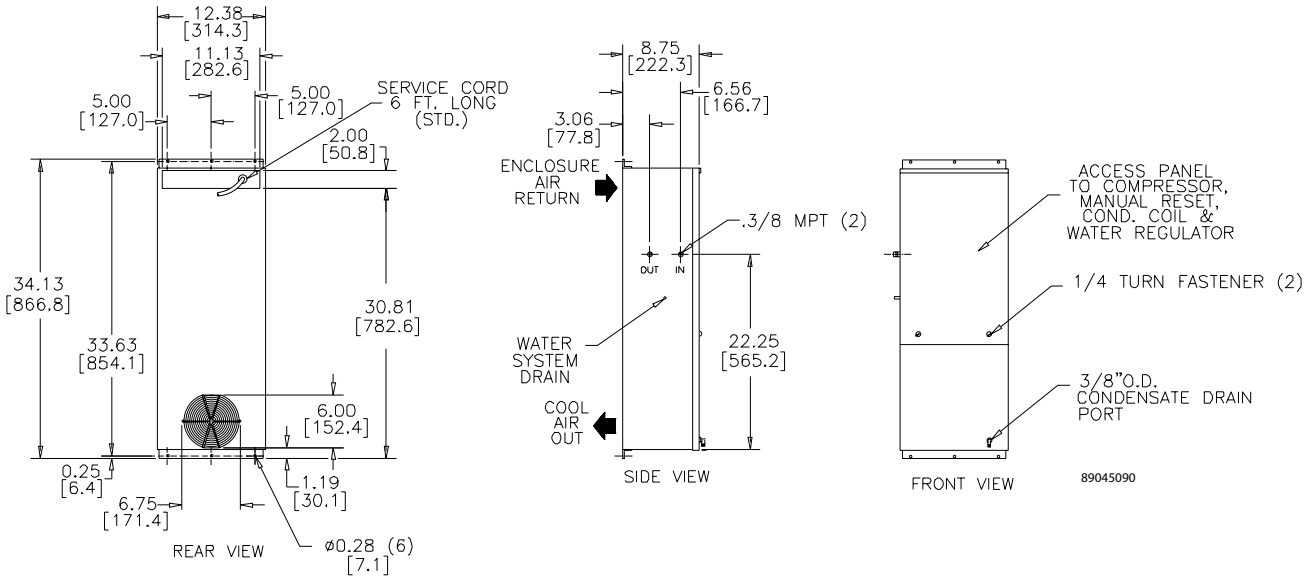
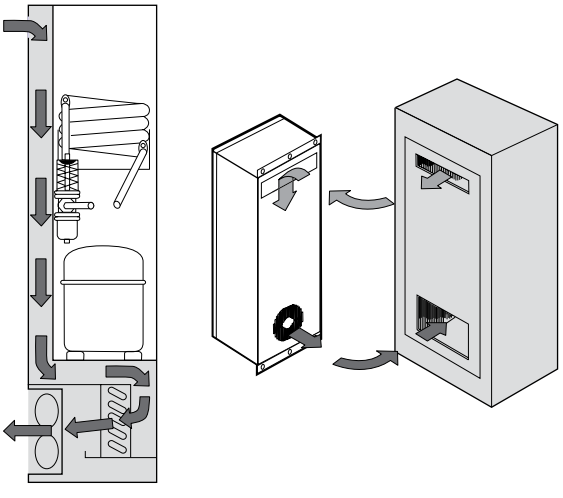
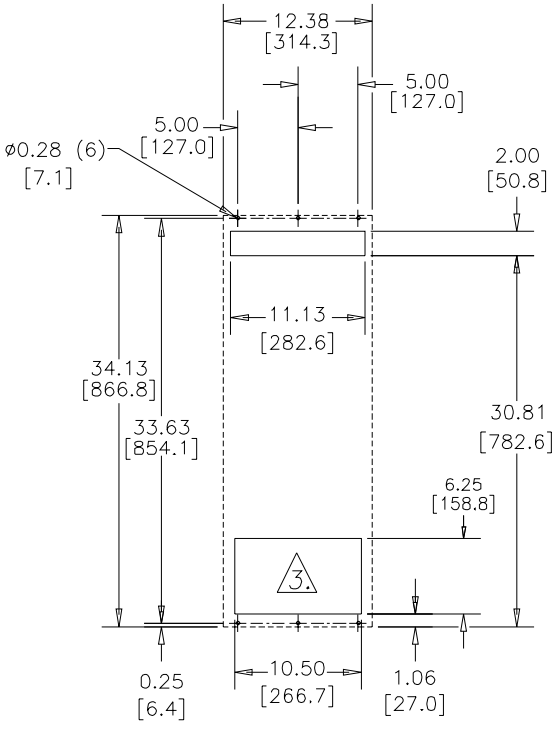
Water Cooled

33WC Models 4000 BTU/Hr. (1172 Watt)







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Water Cooled

Performance Data **CR43WC Models 8000 BTU/Hr. (2345 Watt)**

MODEL NUMBER		
	CR43-0816-GW0XX	CR43-0826-GW0XX
COOLING PERFORMANCE		
Nominal:		
BTUs/Hr.	**8500**	**8500**
Watts	**2490**	**2490**
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	12/341	12/341
Operating Temperature Range:		
Maximum (°F/°C)	131/55	131/55
Minimum (°F/°C)	50/10	50/10
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	135/229	100/170
External loop 50 Hz	WATERFLOW: 1.5 GPM @ 90 F	WATERFLOW: 1.5 GPM @ 90 F
Internal loop 60 Hz (CFM/M^3/Hr.)	145/246	110/187
External loop 60 Hz	WATERFLOW: 1.5 GPM @ 90 F	WATERFLOW: 1.5 GPM @ 90 F
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	1518/1495	1518/1495
Max. Nominal Current (Amps at 50/60 Hz)	13.2/13	6.6/6.5
Starting Current (Amps)	48.3	27
Agency Approvals	Not listed	cUL Listed CE
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 4 Standard	
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Behind Front Cover	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	61 dBA	
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat RAL 7042 Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	43/1092	
Width (in./mm)	15.75/400	
Depth (in./mm)	10.9/279	
Weight (lb./kg)	86/39	

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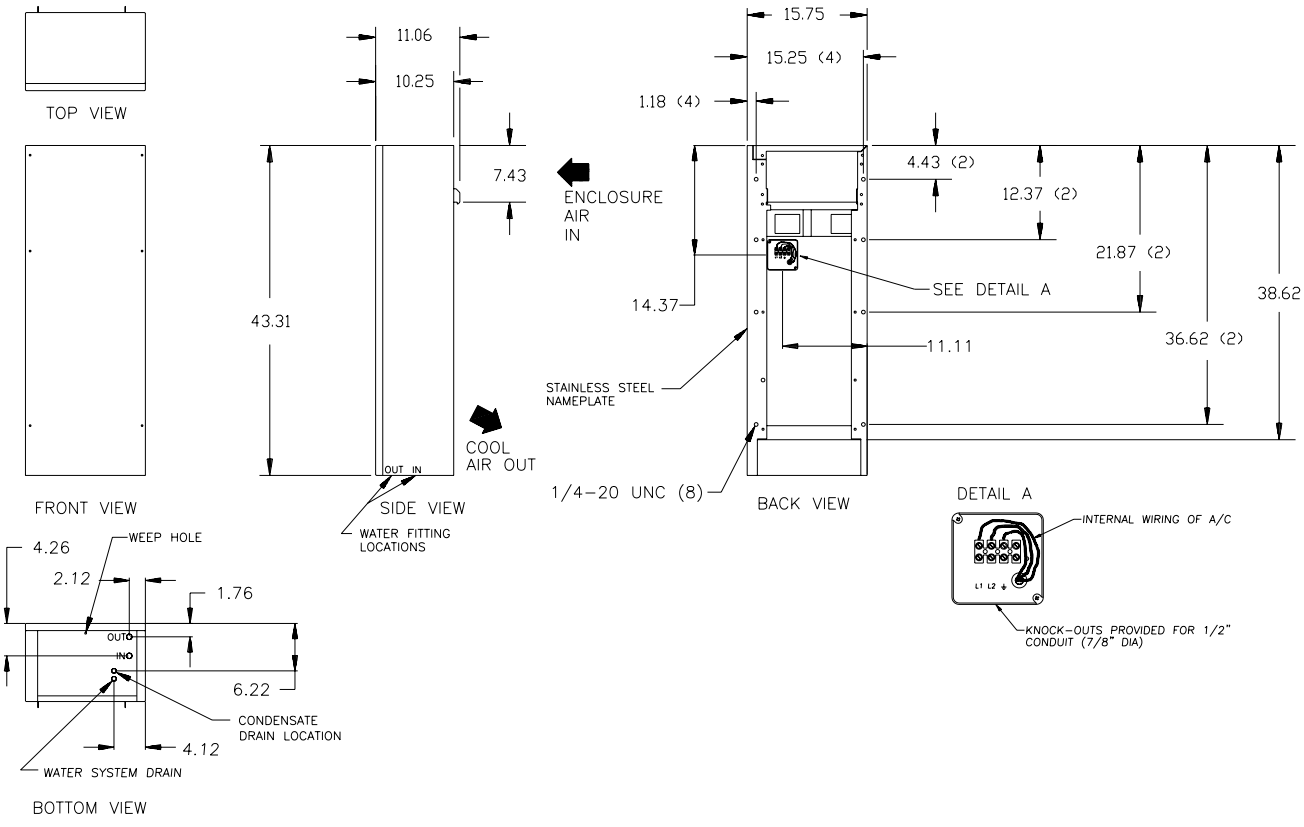
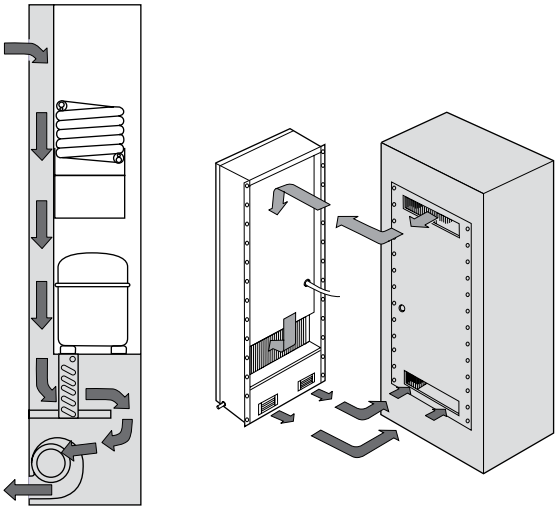
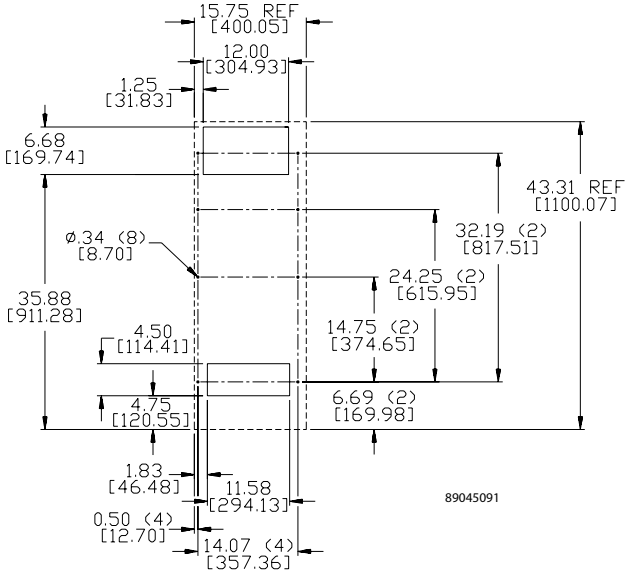
CR43WC Models 8000 BTU/Hr. (2345 Watt)







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Water Cooled

Performance Data **LB11WC Models 4000 BTU/Hr. (1172 Watt)**

MODEL NUMBER		
	LB11-0416-GW008	LB11-0426-GW010
COOLING PERFORMANCE		
Nominal:		
BTUs/Hr.	**3900/4000**	**3900/4000**
Watts	**1142/1172**	**1142/1172**
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	12/340	12/340
Operating Temperature Range:		
Maximum (°F/°C)	125/52	125/52
Minimum (°F/°C)	50/10	50/10
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	135/229	100/170
External loop 50 Hz	WATERFLOW: 1.0 GPM @ 90 F	WATERFLOW: 1.0 GPM @ 90 F
Internal loop 60 Hz (CFM/M^3/Hr.)	145/246	110/187
External loop 60 Hz	WATERFLOW: 1.0 GPM @ 90 F	WATERFLOW: 1.0 GPM @ 90 F
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	885.5/828	897/792
Max. Nominal Current (Amps at 50/60 Hz)	7.7/7.2	3.9/3.6
Starting Current (Amps)	28	14.4
Agency Approvals	Not listed	cUL Listed CE
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 12 Standard	
CONTROLLER		
Description	Basic Mechanical Thermostat	
Thermostat Location	Behind Front cover	
Factory Thermostat Setting (°F/°C)	80/27	
SOUND LEVEL		
At 1.5 Meters	61 dBA	
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat RAL 7042 Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	10.47/266	10.47/266
Width (in./mm)	19/483	19/483
Depth (in./mm)	19.63/499	19.63/499
Weight (lb./kg)	110/50	110/50

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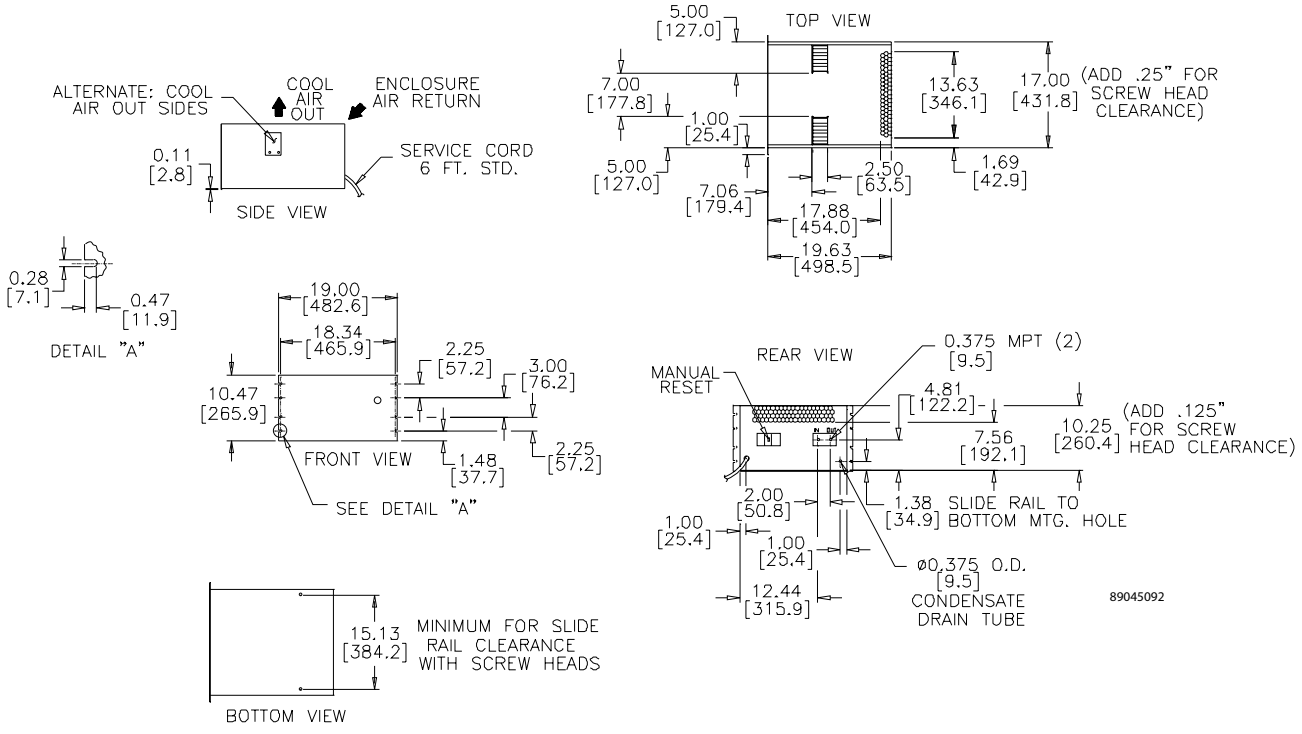
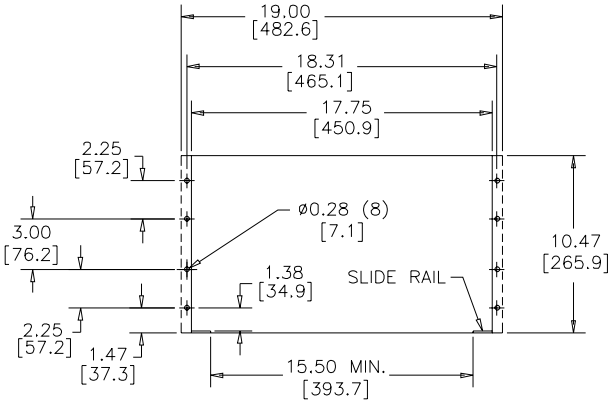
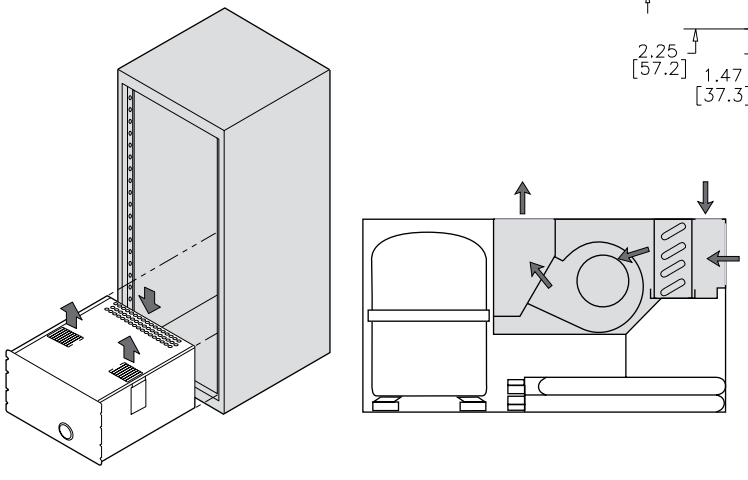
Water Cooled

LB11WC Models 4000 BTU/Hr. (1172 Watt)





Cutout Instructions



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Notes

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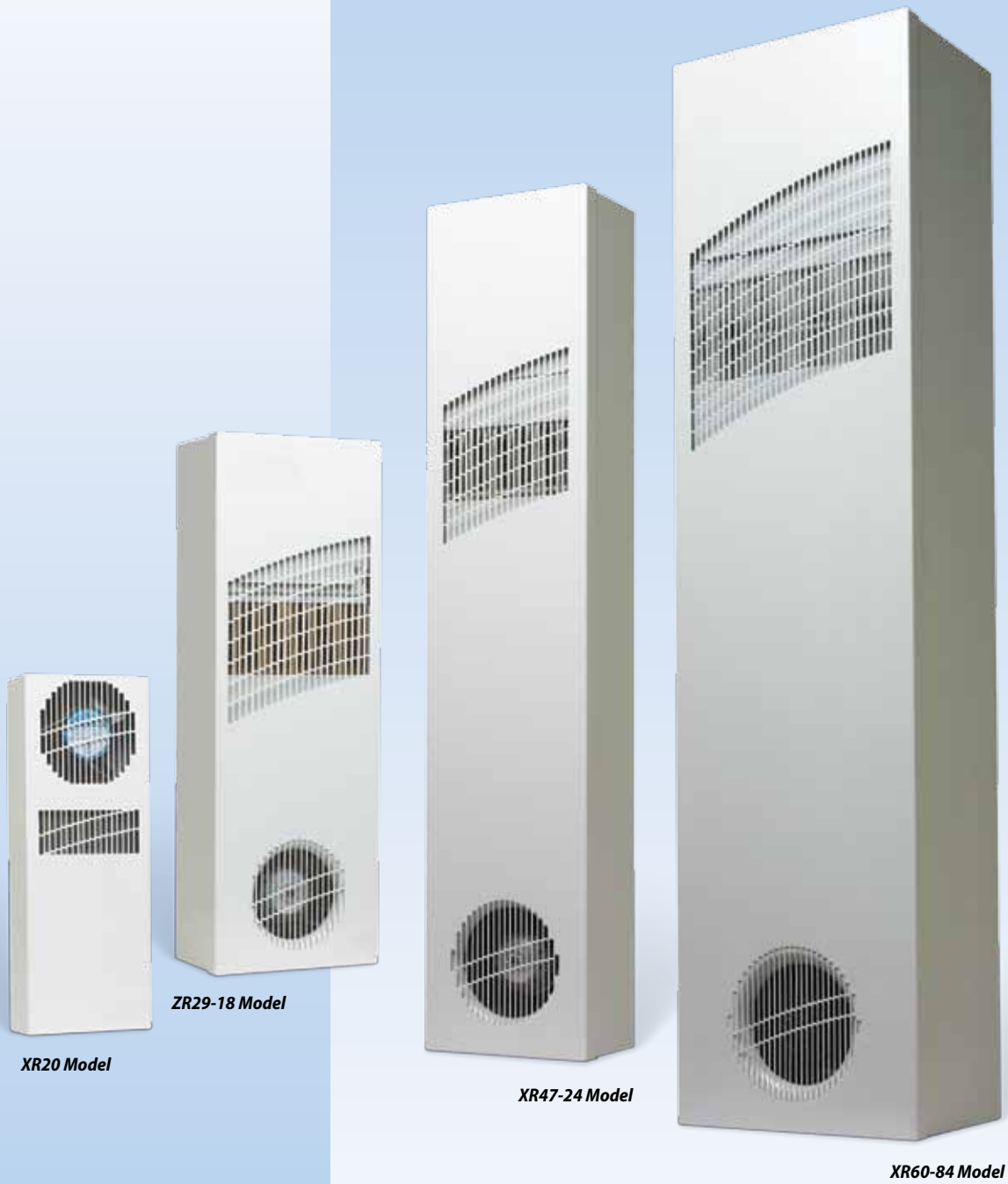
PROAIR™ Indoor Heat Exchangers



XR20 Model

ZR29-18 Model

XR47-24 Model

XR60-84 Model

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Time-proven reliability and low-maintenance design for trouble-free cooling

PROAIR™ Indoor Heat Exchangers

PRODUCT OVERVIEW

Keep your industrial process control equipment cool with this highly reliable Type 12 heat exchanger built for low-maintenance operation. Every unit is able to operate without a filter.

APPLICATIONS

- Industrial drive enclosures
- Automotive assembly systems
- Material handling applications
- Other process control systems

PROAIR Indoor Heat Exchanger Chapter Contents

Indoor Heat Exchangers 116
XR20 Model 117
XR29-08 Model 119
XR29-18 Model 121
XR47-24 Model. 123
XR47-35 Model 125
XR60-55 Model 127
XR60-84 Model 129

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PROAIR™ Indoor Heat Exchangers

Indoor Heat Exchangers

XR20
Models
4 W/°F (7 W/°C)

XR29-08
Models
8 W/°F (14 W/°C)

XR29-18
Models
18 W/°F (32 W/°C)

XR47-24
Models
24 W/°F (43 W/°C)

XR47-35
Models
35 W/°F (63 W/°C)

XR60-55
Models
55 W/°F (99 W/°C)

XR60-84
Models
84 W/°F (151 W/°C)

Industry Standards

UL/cUL Listed or UR/cUR Recognized, CE, others available upon request

- Type 12 on XR20 and XR29-08 models
- Type 3R on XR29-18 and larger models when surface mounted vertically on an enclosure

Application

- Industrial automation
- Package handling equipment
- Security and defense systems
- And more

Features

- Unique counterflow aluminum core for high-efficiency and high-performance heat transfer, except for the XR20 and XR29-08 which use a modified heat pipe core
- Models for 115 and 230 AC volt power input
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from -20 F/-29 C to 140 F/60 C
- Streamlined aesthetics with no visible mounting rails. Slim design allows for mounting to narrow or shallow enclosures.
- Reliable top-quality bearing fans and impellers make these units run quietly and with increased reliability
- Low-carbon mild-steel sheet-metal cover for rugged factory environments
- Easy-mount flanges for simple installation
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Filterless design for low maintenance and easy cleaning
- Four fasteners allow simple removal of front cover for easy access

Finish

- ANSI 70 gray powder-coat paint in a semi-gloss finish
- Stainless steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

Options

- Special Voltage Package
- Outdoor Package*
- Harsh Environment Package*
- Stainless Steel Package*

* CLIMAGUARD™ may be more appropriate. Refer to CLIMAGUARD HEX chapter. Consult the factory for availability and catalog number.

Notes

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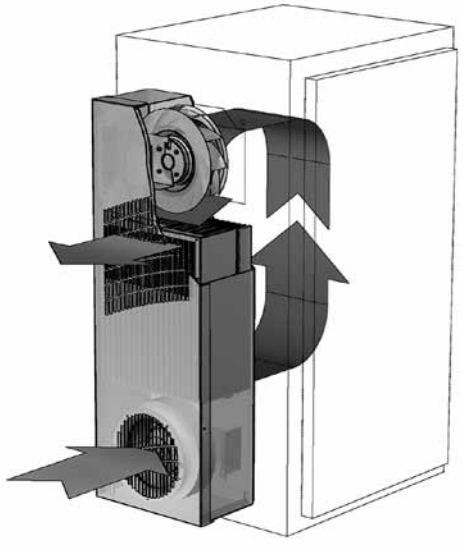

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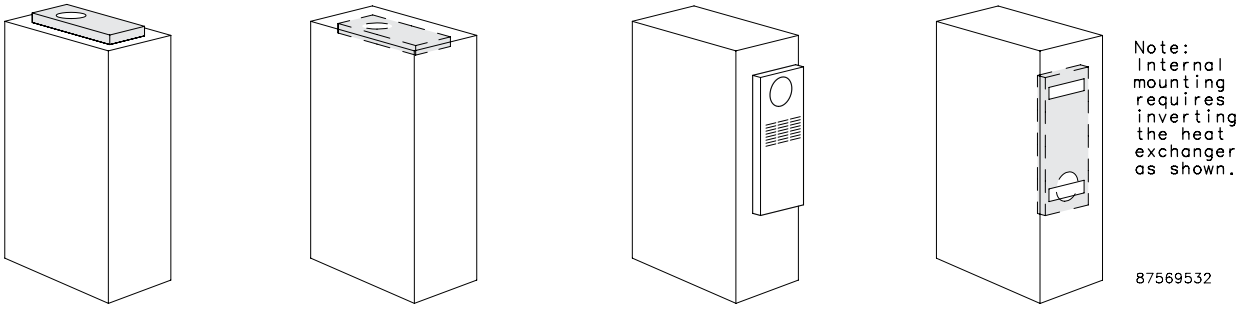
PROAIR™ Indoor Heat Exchangers

Performance Data **XR20 Models 4 W/°F (7 W/°C)**

MODEL NUMBER	XR20-0216-012	XR20-0226-012
COOLING PERFORMANCE		
Nominal:		
Watts per °F	**4**	**4**
Watts per °C	**7**	**7**
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	4/113	4/113
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	71/121	71/121
External loop 50 Hz (CFM/M^3/Hr.)	75/127	75/127
Internal loop 60 Hz (CFM/M^3/Hr.)	74/126	74/126
External loop 60 Hz (CFM/M^3/Hr.)	78/132	78/132
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	69	69
Max. Nominal Current (Amps at 50/60 Hz)	0.6	0.3
Agency Approvals	cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 12 Standard	
SOUND LEVEL		
At 1.5 Meters	56 dBA	
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	20/508	20/508
Width (in./mm)	7.5/190.5	7.5/190.5
Depth (in./mm)	3/76.2	3/76.2
Weight (lb./kg)	12/5.4	12/5.4

Mounting Options



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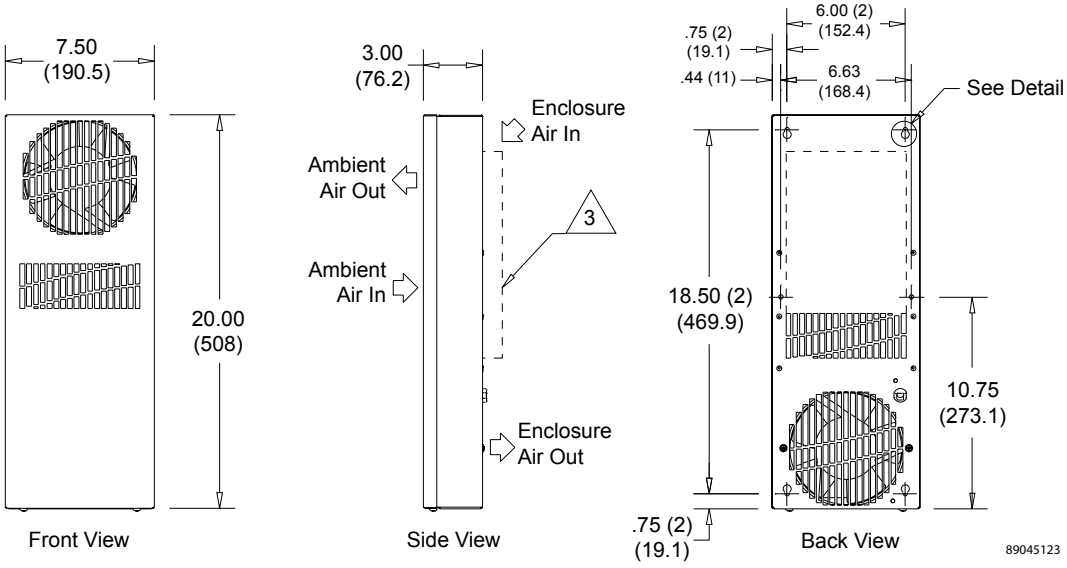
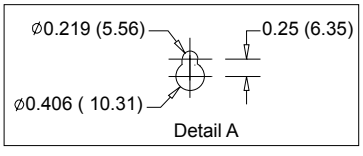
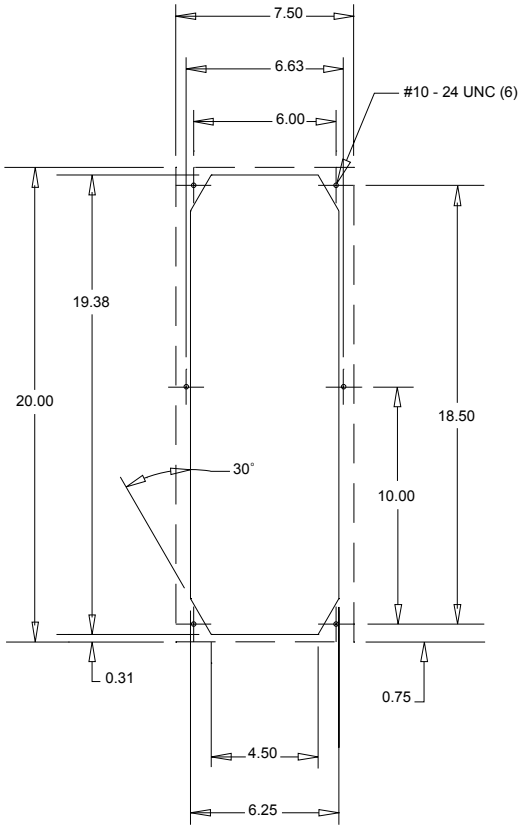
PROAIR™ Indoor Heat Exchangers

XR20 Models 4 W/°F (7 W/°C)





Note:
1. Supplied with mounting gasket kit.
2. Service cord terminated with appropriate plug:
   NEMA 5-15P for 115V units
   NEMA 6-15P for 230V units
3. Detachable airflow plenum may be used when mounting the heat exchanger inside or outside of the enclosre.



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PROAIR™ Indoor Heat Exchangers

Performance Data **XR29 Models 8 W/°F (14 W/°C)**

MODEL NUMBER		
	XR29-0816-012	XR29-0826-012
COOLING PERFORMANCE		
Nominal:		
Watts per °F	**8**	**8**
Watts per °C	**14**	**14**
Refrigerant	R-134A	R-134A
Refrigerant Charge (ounces/grams)	5.5/156	5.5/156
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	71/121	71/121
External loop 50 Hz (CFM/M^3/Hr.)	75/127	75/127
Internal loop 60 Hz (CFM/M^3/Hr.)	74/126	74/126
External loop 60 Hz (CFM/M^3/Hr.)	78/132	78/132
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	69	69
Max. Nominal Current (Amps at 50/60 Hz)	0.6	0.3
Agency Approvals	cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 12 Standard	
SOUND LEVEL		
At 1.5 Meters	56 dBA	
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	29.5/749.3	29.5/749.3
Width (in./mm)	10/254	10/254
Depth (in./mm)	3.09/78.5	3.09/78.5
Weight (lb./kg)	21/9.5	21/9.5

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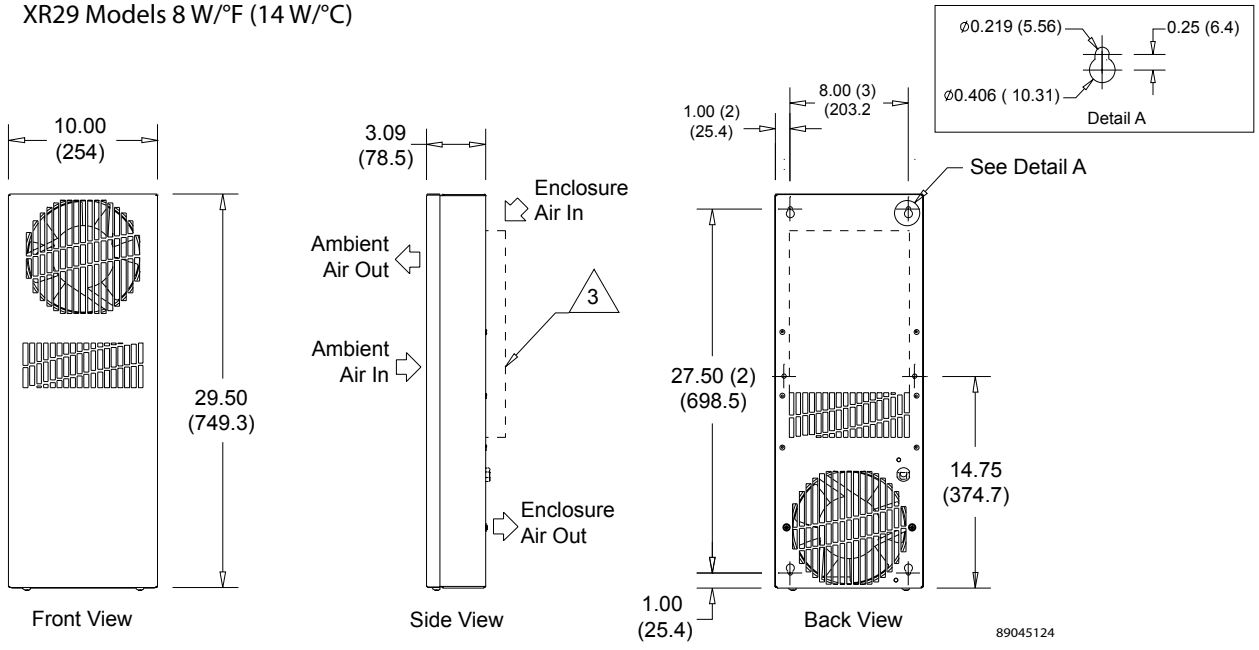
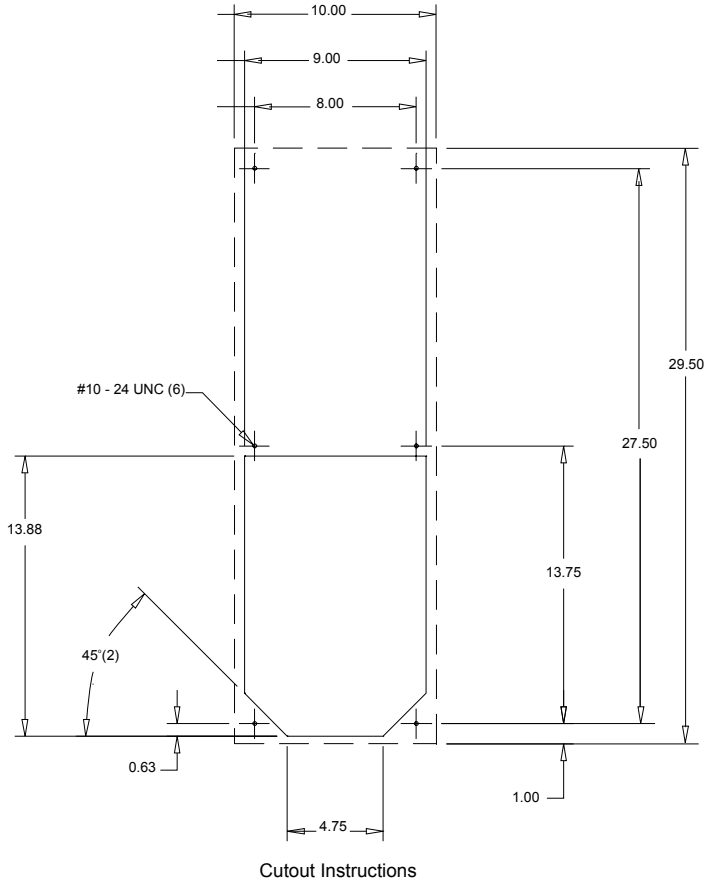
PROAIR™ Indoor Heat Exchangers

XR29 Models 8 W/°F (14 W/°C)



Note:
1. Supplied with mounting gasket kit.
2. Service cord terminated with appropriate plug:
   NEMA 5-15P for 115V units
   NEMA 6-15P for 230V units
3. Detachable airflow plenum may be used when mounting the heat exchanger inside or outside of the enclosre.



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PROAIR™ Indoor Heat Exchangers

Performance Data **XR29 Models 18 W/°F (32 W/°C)**

MODEL NUMBER		
	XR29-1816-012	XR29-1826-012
COOLING PERFORMANCE		
Nominal:		
Watts per °F	**18**	**18**
Watts per °C	**32**	**32**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	126/214	126/214
External loop 50 Hz (CFM/M^3/Hr.)	120/204	120/204
Internal loop 60 Hz (CFM/M^3/Hr.)	140/237	140/237
External loop 60 Hz (CFM/M^3/Hr.)	133/226	133/226
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	207	207
Max. Nominal Current (Amps at 50/60 Hz)	1.8	0.9
Agency Approvals	cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 12 Standard	
SOUND LEVEL		
At 1.5 Meters	64 dBA	
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	29.66/753.4	29.66/753.4
Width (in./mm)	10.24/260.1	10.24/260.1
Depth (in./mm)	5.92/150.4	5.92/150.4
Weight (lb./kg)	32/15	32/15

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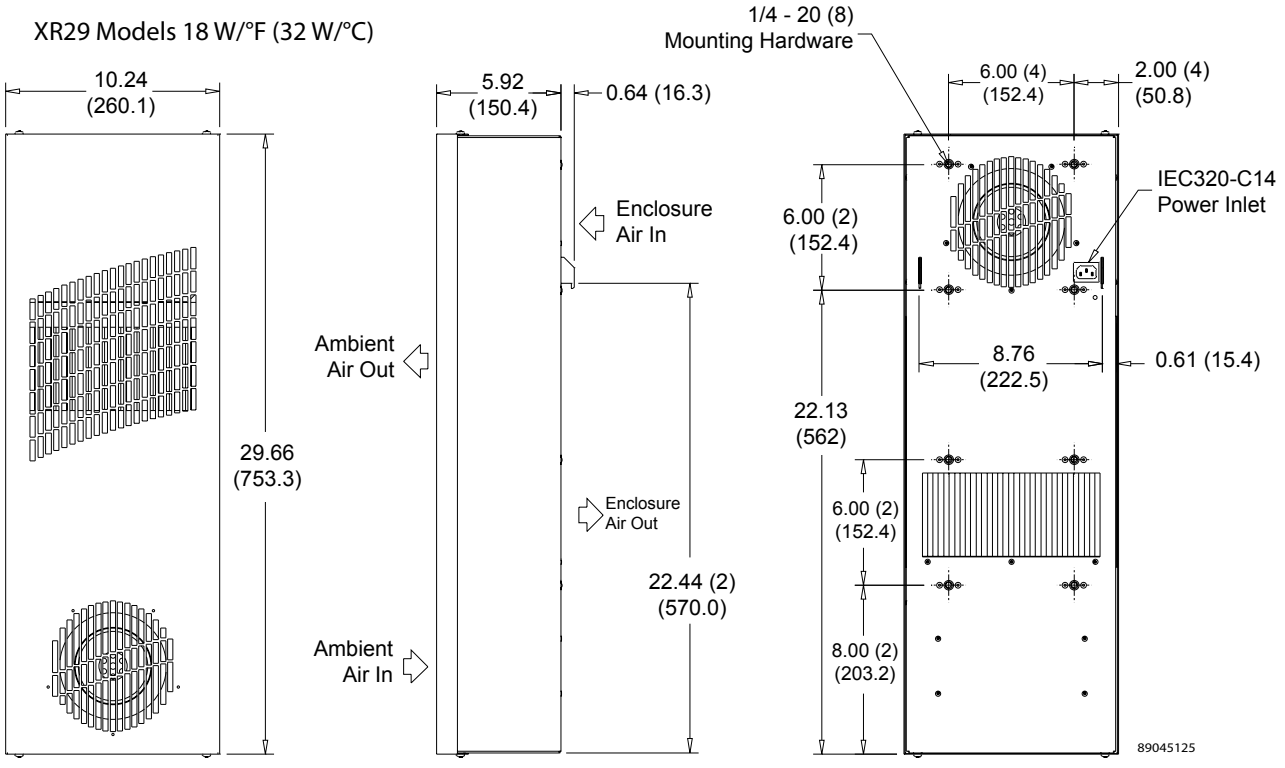
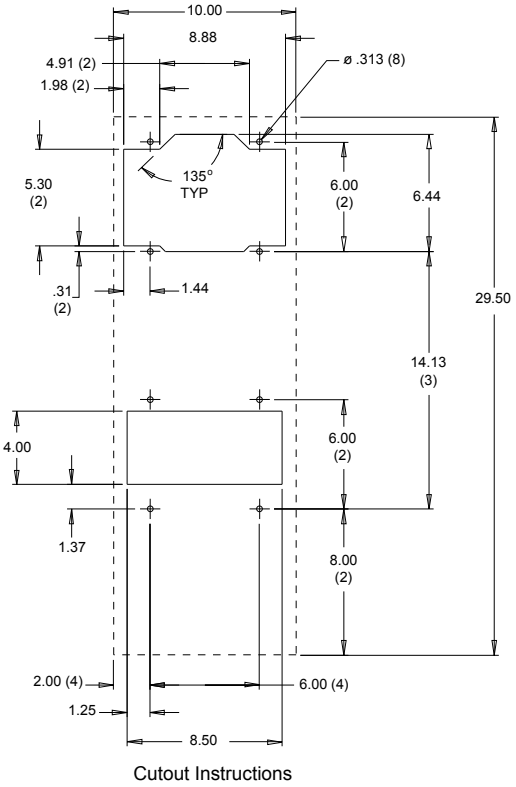
PROAIR™ Indoor Heat Exchangers

XR29 Models 18 W/°F (32 W/°C)





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PROAIR™ Indoor Heat Exchangers

Performance Data **XR47 Models 24 W/°F (43 W/°C)**

MODEL NUMBER		
	XR47-2416-012	XR47-2426-012
COOLING PERFORMANCE		
Nominal:		
Watts per °F	**24**	**24**
Watts per °C	**43**	**43**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	140/238	140/238
External loop 50 Hz (CFM/M^3/Hr.)	118/200	118/200
Internal loop 60 Hz (CFM/M^3/Hr.)	156/265	156/265
External loop 60 Hz (CFM/M^3/Hr.)	131/222	131/222
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	207	207
Max. Nominal Current (Amps at 50/60 Hz)	1.8	0.9
Agency Approvals	cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 12 Standard	
SOUND LEVEL		
At 1.5 Meters	68 dBA	
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	47.16/1197.9	47.16/1197.9
Width (in./mm)	10.24/260.1	10.24/260.1
Depth (in./mm)	5.92/150.4	5.92/150.4
Weight (lb./kg)	51/23	51/23

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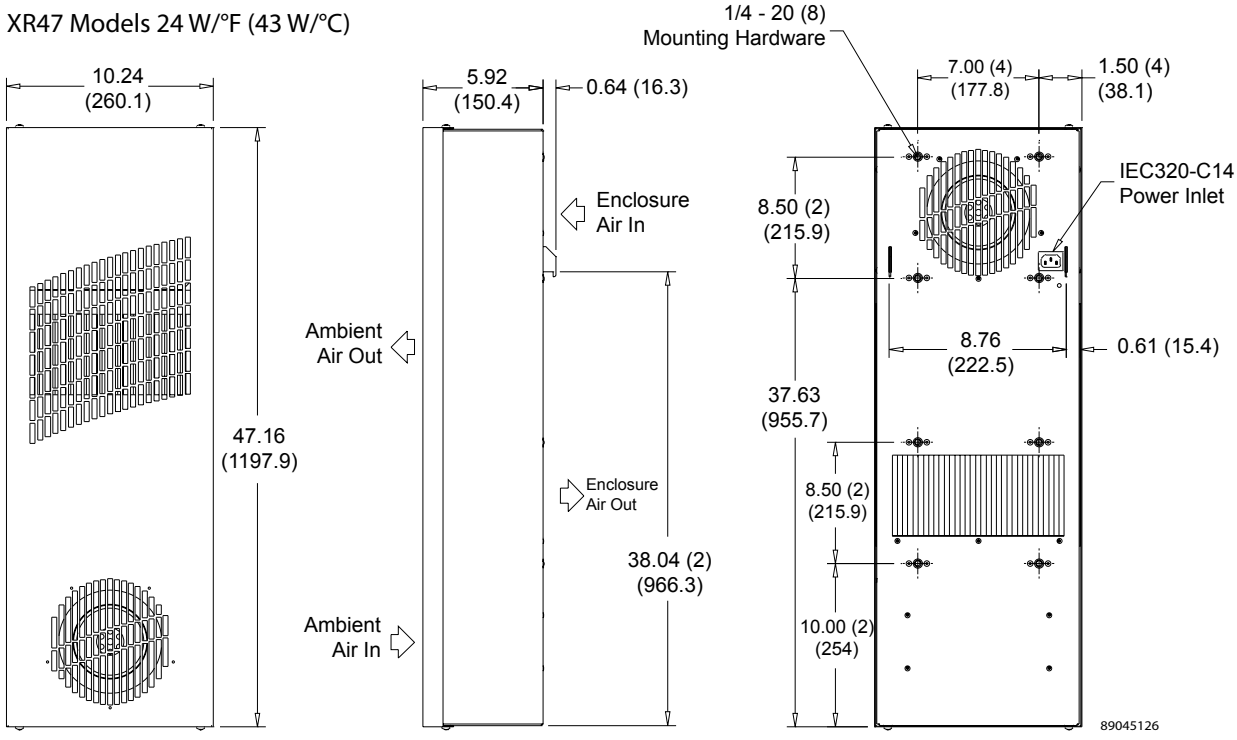
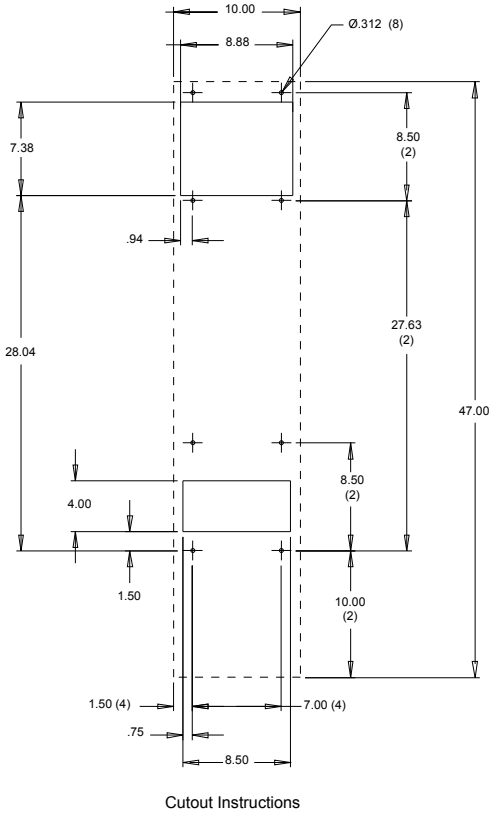
PROAIR™ Indoor Heat Exchangers

XR47 Models 24 W/°F (43 W/°C)





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PROAIR™ Indoor Heat Exchangers

Performance Data **XR47 Models 35 W/°F (63 W/°C)**

MODEL NUMBER		
	XR47-3516-012	XR47-3526-012
COOLING PERFORMANCE		
Nominal:		
Watts per °F	**35**	**35**
Watts per °C	**63**	**63**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	120/204	120/204
External loop 50 Hz (CFM/M^3/Hr.)	131/222	131/222
Internal loop 60 Hz (CFM/M^3/Hr.)	133/226	133/226
External loop 60 Hz (CFM/M^3/Hr.)	146/248	146/248
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	207	207
Max. Nominal Current (Amps at 50/60 Hz)	1.8	0.9
Agency Approvals	cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 12 Standard	
SOUND LEVEL		
At 1.5 Meters	68 dBA	
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	47.16/1197.9	47.16/1197.9
Width (in./mm)	15.24/387.1	15.24/387.1
Depth (in./mm)	5.92/150.4	5.92/150.4
Weight (lb./kg)	59/27	59/27

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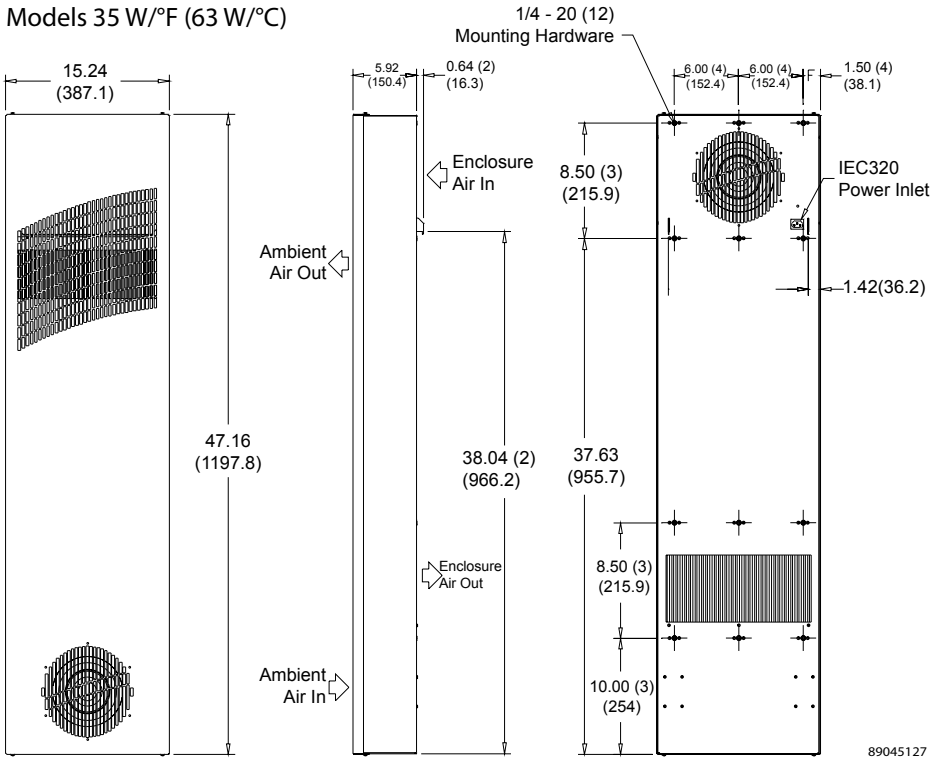
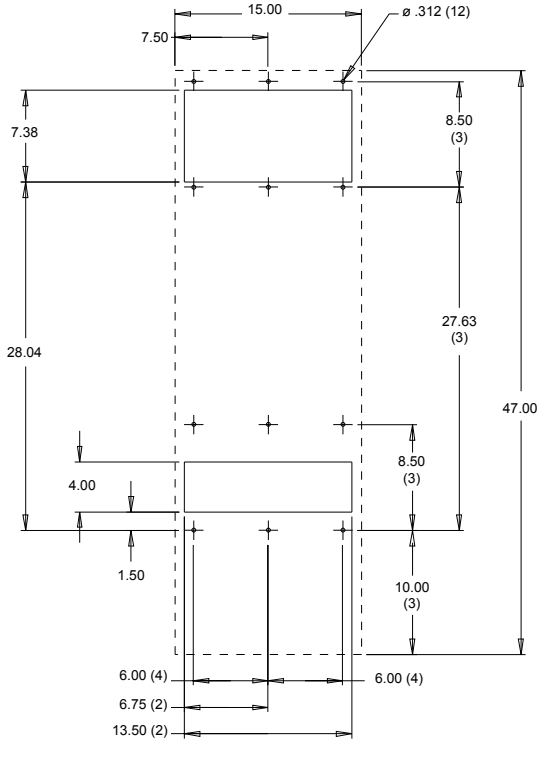
PROAIR™ Indoor Heat Exchangers

XR47 Models 35 W/°F (63 W/°C)





Note:
1. Supplied with mounting gasket kit (not shown).
2. 2-meter long service cord supplied with appropriate plug:
   NEMA 5-15P for 115V units
   NEMA 6-15P for 230V units

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PROAIR™ Indoor Heat Exchangers

Performance Data **XR60 Models 55 W/°F (99 W/°C)**

MODEL NUMBER		
	XR60-5516-012	XR60-5526-012
COOLING PERFORMANCE		
Nominal:		
Watts per °F	**55**	**55**
Watts per °C	**99**	**99**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	398/676	398/676
External loop 50 Hz (CFM/M^3/Hr.)	429/729	429/729
Internal loop 60 Hz (CFM/M^3/Hr.)	442/751	442/751
External loop 60 Hz (CFM/M^3/Hr.)	477/810	477/810
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	759	759
Max. Nominal Current (Amps at 50/60 Hz)	6.6	3.3
Agency Approvals	cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 12 Standard	
SOUND LEVEL		
At 1.5 Meters	73 dBA	
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	59.66/1515.4	59.66/1515.4
Width (in./mm)	15.24/387.1	15.24/387.1
Depth (in./mm)	5.92/150.4	5.92/150.4
Weight (lb./kg)	86/39	86/39

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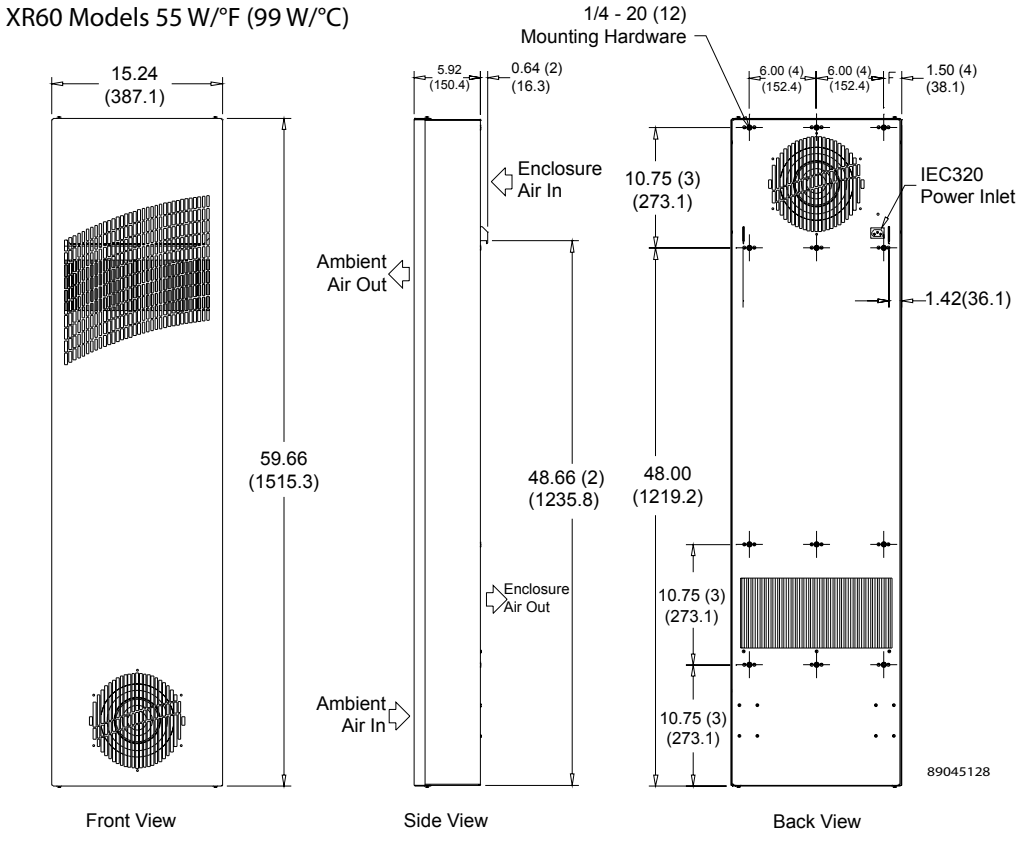
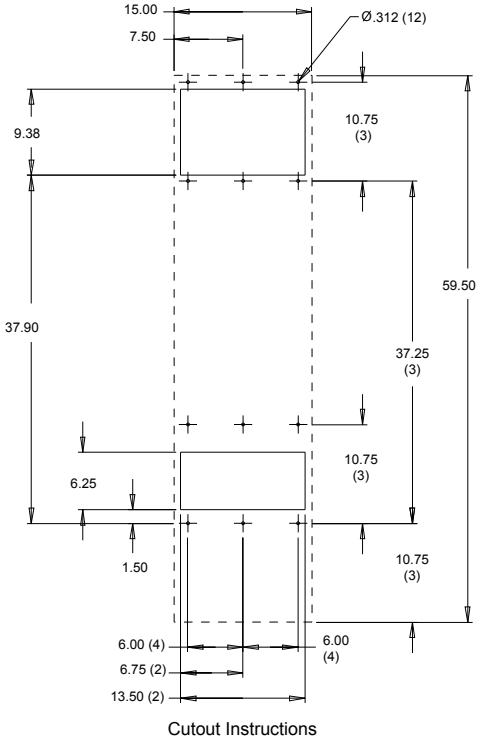
PROAIR™ Indoor Heat Exchangers

XR60 Models 55 W/°F (99 W/°C)





Note:
1. Supplied with mounting gasket kit (not shown).
2. 2-meter long service cord supplied with appropriate plug:
   NEMA 5-15P for 115V units
   NEMA 6-15P for 230V units

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PROAIR™ Indoor Heat Exchangers

Performance Data **XR60 Models 84 W/°F (151 W/°C)**

MODEL NUMBER		
	XR60-8416-012	XR60-8426-012
COOLING PERFORMANCE		
Nominal:		
Watts per °F	**84**	**84**
Watts per °C	**151**	**151**
Refrigerant	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A
Operating Temperature Range:		
Maximum (°F/°C)	140/60	140/60
Minimum (°F/°C)	-20/-29	-20/-29
Air Flow at 0 Static Pressure:		
Internal loop 50 Hz (CFM/M^3/Hr.)	497/844	497/844
External loop 50 Hz (CFM/M^3/Hr.)	434/737	434/737
Internal loop 60 Hz (CFM/M^3/Hr.)	552/938	552/938
External loop 60 Hz (CFM/M^3/Hr.)	482/819	482/819
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Operating Range	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	759	759
Max. Nominal Current (Amps at 50/60 Hz)	6.6	3.3
Agency Approvals	cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord
ENCLOSURE PROTECTION		
UL Type	Type 12 Standard	
SOUND LEVEL		
At 1.5 Meters	73 dBA	
UNIT CONSTRUCTION		
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS		
Height (in./mm)	59.66/1515.4	59.66/1515.4
Width (in./mm)	15.24/387.1	15.24/387.1
Depth (in./mm)	9.92/252	9.92/252
Weight (lb./kg)	106/48	106/48

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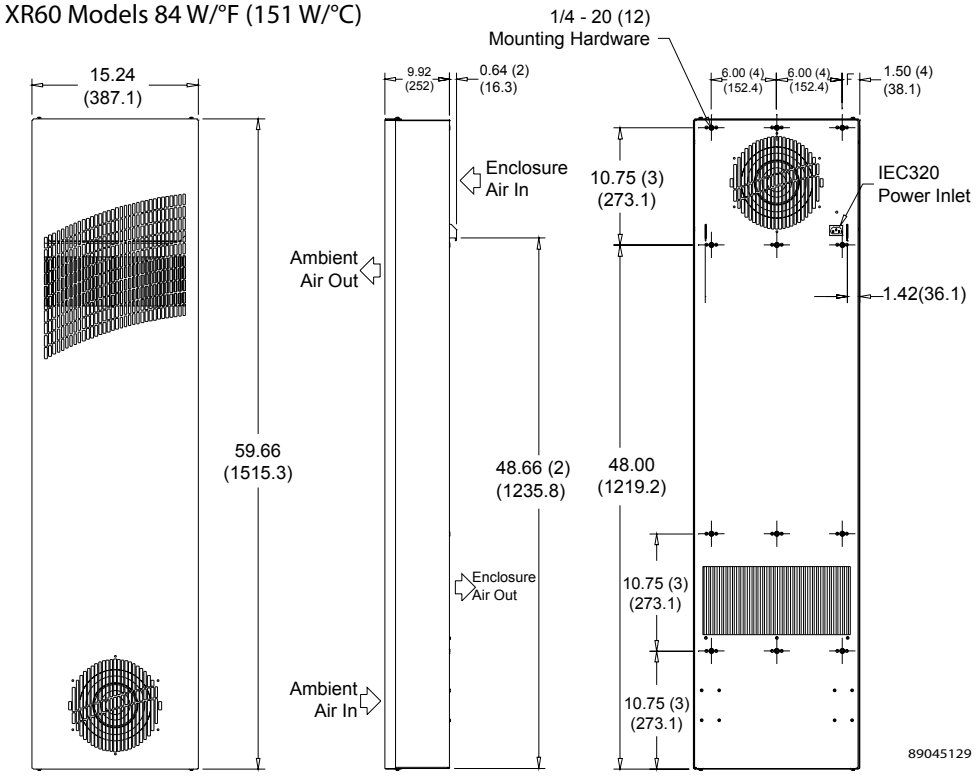
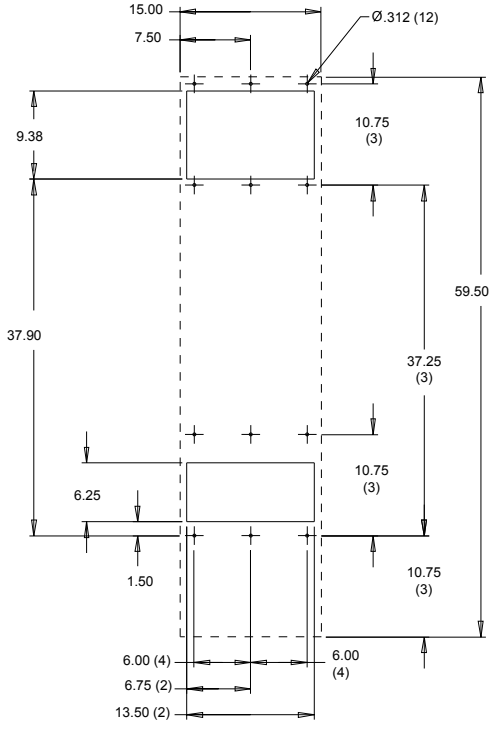
PROAIR™ Indoor Heat Exchangers

XR60 Models 84 W/°F (151 W/°C)



Note:
1. Supplied with mounting gasket kit (not shown).
2. 2-meter long service cord supplied with appropriate plug:
   NEMA 5-15P for 115V units
   NEMA 6-15P for 230V units



Cutout Instructions

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Notes

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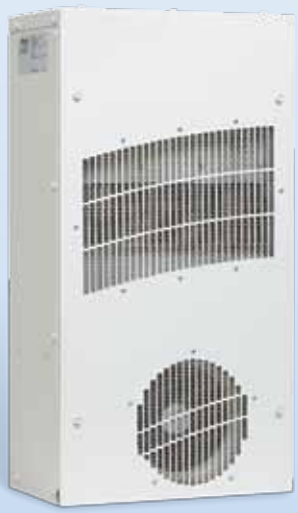

TX23 Model

TX38 Model

TX52 Model

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Lab- and field-tested
to seal out extreme weather

CLIMAGUARD™ Outdoor Heat Exchangers

PRODUCT OVERVIEW

Put this Type 4 / Telcordia GR-487-capable heat exchanger to the test. You'll find that every unit keeps your outdoor enclosure sealed tight for reliable closed-loop cooling. Works on AC or DC voltage power input.

APPLICATIONS

- Telecommunications cabinets
- Alternative energy
- Outside plant applications
- Other outdoor electronic systems

CLIMAGUARD™ Outdoor Heat Exchanger Chapter Contents

Outdoor Heat Exchangers 134
TX23 Indoor Model 135
TX33 Indoor Model 138
TX38 Outdoor Model 141
TX52 Outdoor Model 144

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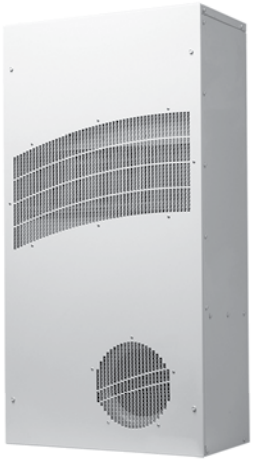
CLIMAGUARD™ Outdoor Heat Exchanger

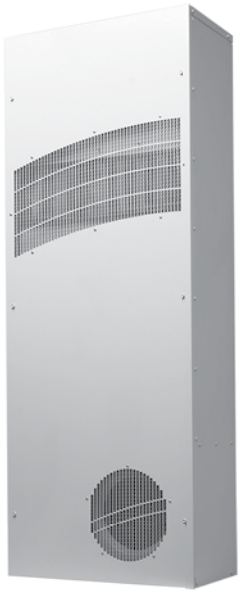
Outdoor Heat Exchangers

TX23
Models
14 W/°F (25 W/°C)

TX33
Models
28 W/°F (50 W/°C)



TX38
Models
56 W/°F (100 W/°C)



TX52
Models
83 W/°F (150 W/°C)

Industry Standards

UL/cUL Listed or UR/cUR Recognized, CE, others available upon request

- Telcordia GR-487 capable
- Type 12/3R/4 Standard
- Type 4X stainless steel option available

Application

- Telecom shelters
- Outdoor cabinets
- Equipment buildings
- Instrument enclosures
- And more

Features

- Unique counterflow aluminum core for high efficiency and high performance heat transfer
- Models for 24 VDC, 48 VDC, 115 VAC and 230 VAC power supplies
- UL Listed or Recognized to save customers time and money with agency approvals
- Operating temperature range from -40 F/-40 C to 149 F/65 C
- Variable speed blowers standard on DC powered units for quiet running
- Surface or recessed mount capable
- Low-carbon mild-steel sheet-metal cover for rugged factory environments
- Easy-mount flanges for simple installation
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Filterless design for low maintenance and easy cleaning
- Engineered for temperature extremes, corrosive environments and wind driven rain

Finish

- ANSI 70 gray powder-coat paint in a semi-gloss finish
- Stainless steel Type 304 or 316 finishes available on Type 4X models
- Other colors and textures available

Options

- Thermostat Package
- Special Voltage Package
- Outdoor Package
- Harsh Environment Package*
- Stainless Steel Package*
- Heater Package*

* Consult the factory for availability and catalog number.

Notes

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CLIMAGUARD™ Outdoor Heat Exchanger

Performance Data **TX23 Models 14 W/°F (25 W/°C)**

MODEL NUMBER	TX23-1416-100	TX23-1426-100	TX23-1424-100	TX23-1448-100
COOLING PERFORMANCE				
Nominal:				
Watts per °F	**14**	**14**	**14**	**14**
Watts per °C	**25**	**25**	**25**	**25**
Refrigerant	N/A	N/A	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A	N/A	N/A
Operating Temperature Range				
Maximum (°F/°C)	149/65	149/65	149/65	149/65
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:				
Internal loop 50 Hz (CFM/M^3/Hr.)	69/117	69/117	N/A	N/A
External loop 50 Hz (CFM/M^3/Hr.)	58/98	58/98	N/A	N/A
Internal loop 60 Hz (CFM/M^3/Hr.)	84/142	84/142	175/268	175/268
External loop 60 Hz (CFM/M^3/Hr.)	69/117	69/117	158/297	158/297
ELECTRICAL DATA				
Rated Voltage	**115 VAC**	**230 VAC**	**24 VDC**	**48 VDC**
Frequency (Hz)	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	69	23	82	87
Max. Nominal Current (Amps at 50/60 Hz)	0.6	0.1	3.4	1.8
Agency Approvals	cUL Listed CE		cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	Terminal Block	Terminal Block
ENCLOSURE PROTECTION				
UL Type	Type 12/3R/4 Standard 4X Optional		Type 12/3R/4 Standard 4X Optional	
SOUND LEVEL				
At 1.5 M	56 dBA		56 dBA	
UNIT CONSTRUCTION				
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard		Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS				
Height (in./mm)	23/584.2	23/584.2	23/584.2	23/584.2
Width (in./mm)	12/304.8	12/304.8	12/304.8	12/304.8
Depth (in./mm)	7.1/180.3	7.1/180.3	7.1/180.3	7.1/180.3
Weight (lb./kg)	30/13.6	30/13.6	30/13.6	30/13.6

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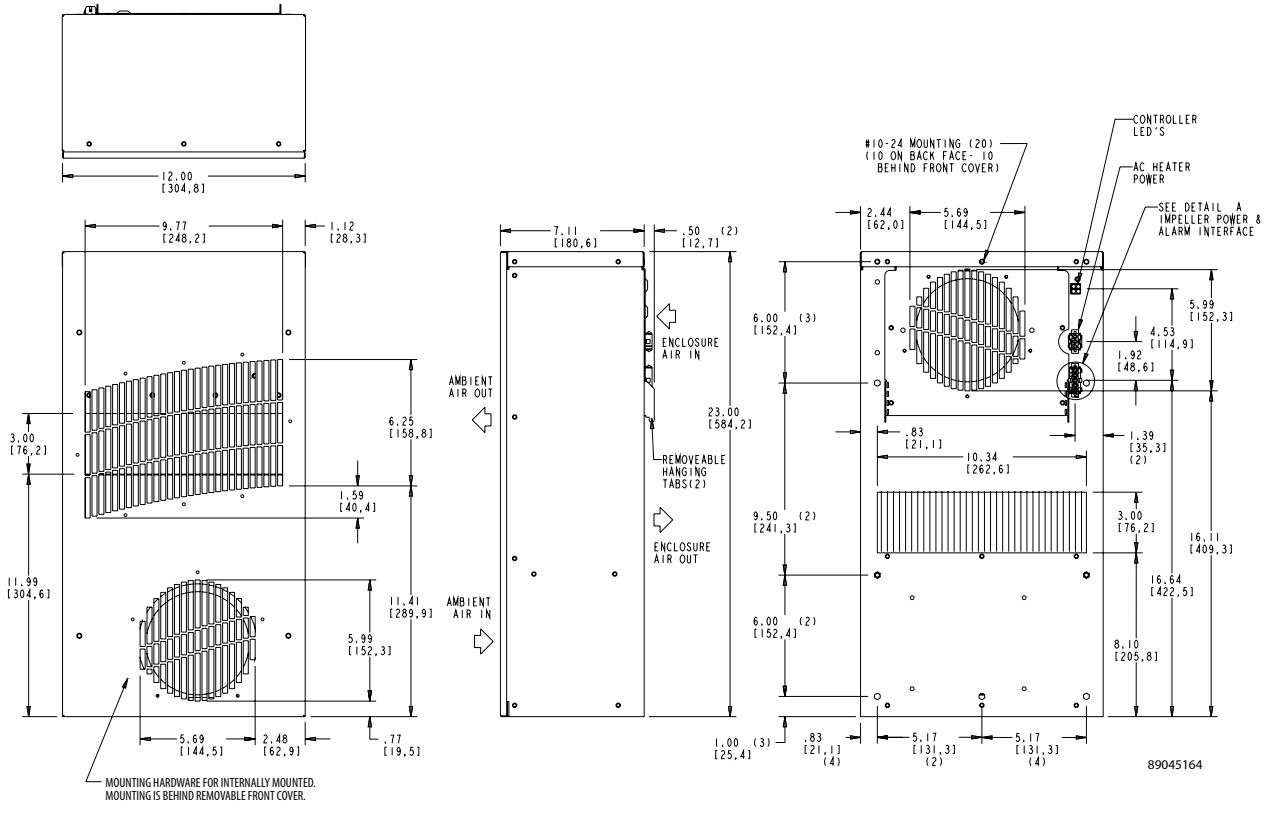
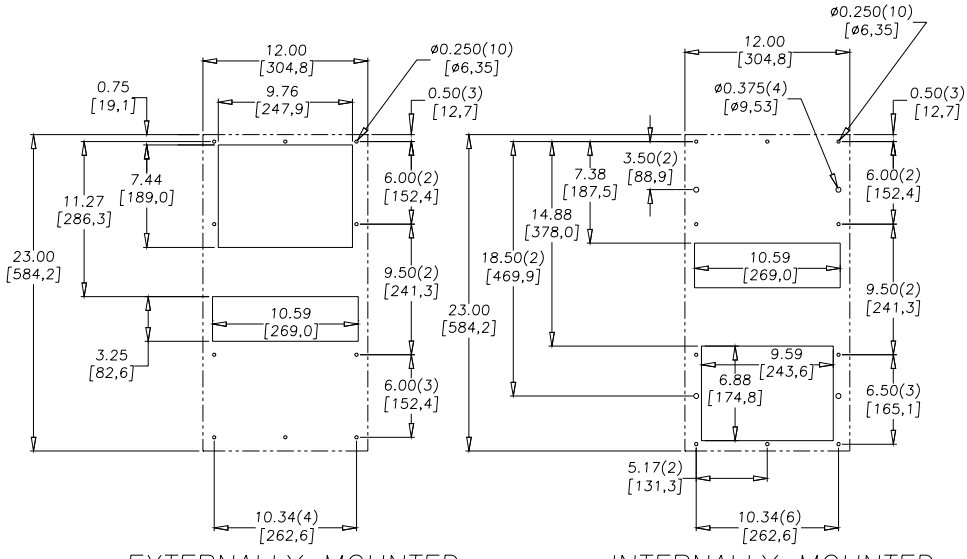
CLIMAGUARD™ Outdoor Heat Exchanger

TX23 DC Models 14 W/°F (25 W/°C)





CUTOUT INSTRUCTIONS
(AS VIEWED FROM OUTSIDE OF ENCLOSURE)

NOTES:
1. DASHED LINES REPRESENT HEAT EXCHANGER.

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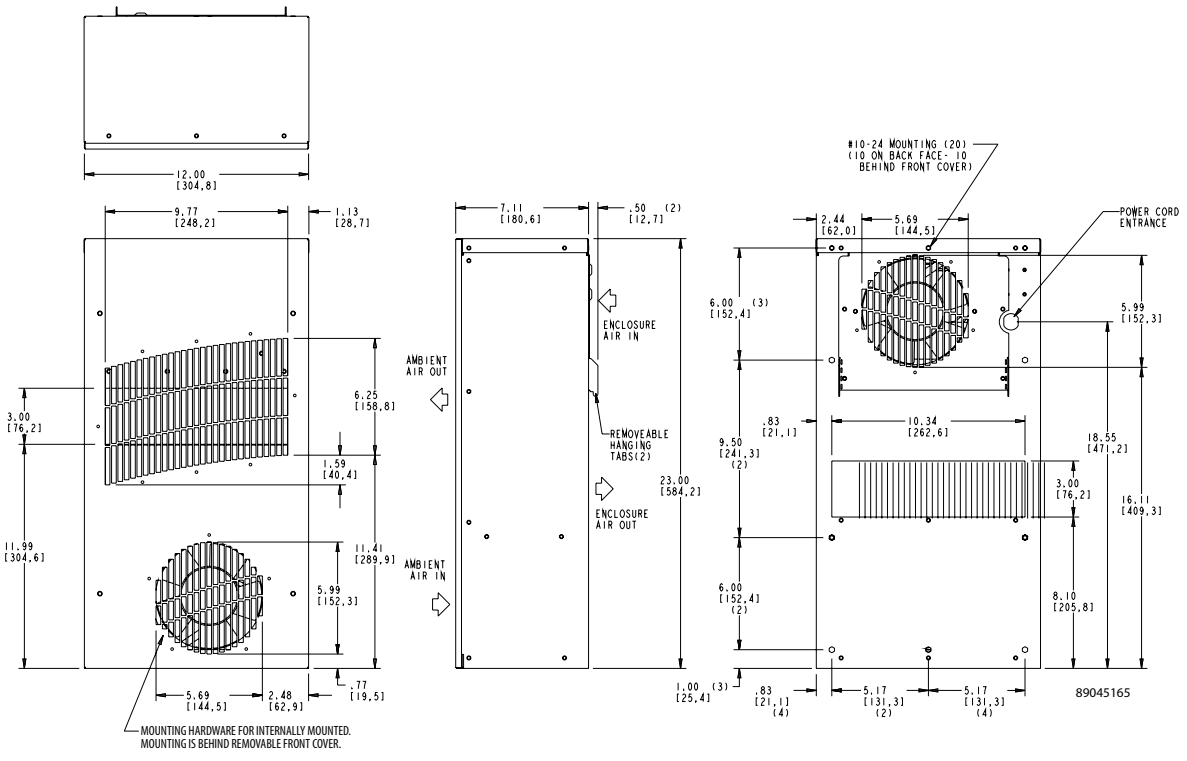
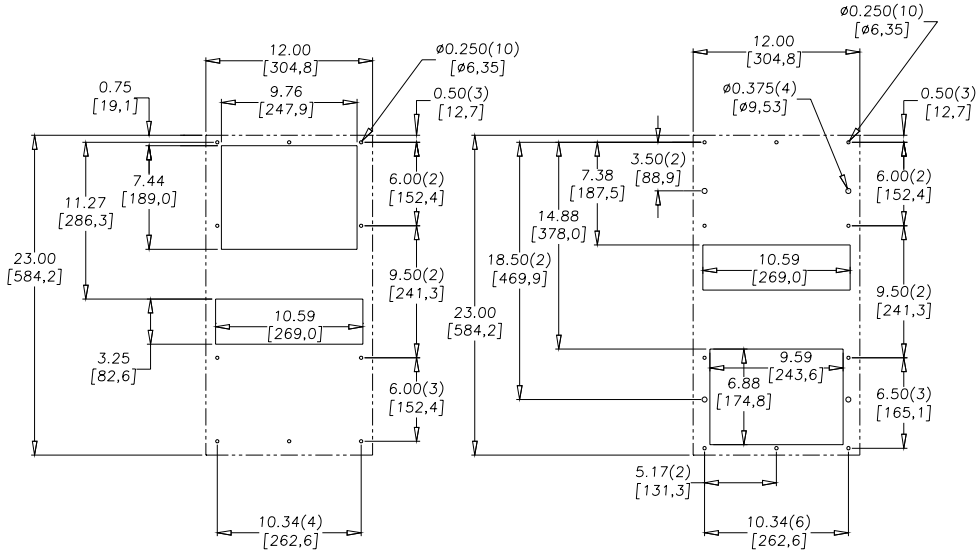
CLIMAGUARD™ Outdoor Heat Exchanger

TX23 AC Models 14 W/°F (25 W/°C)





NOTES:
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CLIMAGUARD™ Outdoor Heat Exchanger

Performance Data **TX33 Models 28 W/°F (50 W/°C)**

MODEL NUMBER	TX33-2816-100	TX33-2826-100	TX33-2824-100	TX33-2848-100
COOLING PERFORMANCE				
Nominal:				
Watts per °F	**28**	**28**	**28**	**28**
Watts per °C	**50**	**50**	**50**	**50**
Refrigerant	N/A	N/A	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A	N/A	N/A
Operating Temperature Range:				
Maximum (°F/°C)	149/65	149/65	149/65	149/65
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:				
Internal loop 50 Hz (CFM/M^3/Hr.)	212/360	212/360	N/A	N/A
External loop 50 Hz (CFM/M^3/Hr.)	238/404	238/404	N/A	N/A
Internal loop 60 Hz (CFM/M^3/Hr.)	228/387	228/387	228/387	228/387
External loop 60 Hz (CFM/M^3/Hr.)	263/447	263/447	166/282	166/282
ELECTRICAL DATA				
Rated Voltage	**115 VAC**	**230 VAC**	**24 VDC**	**48 VDC**
Frequency (Hz)	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	161	92	82	87
Max. Nominal Current (Amps at 50/60 Hz)	1.4	0.4	3.4	1.8
Agency Approvals	cUL Listed CE		cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	Terminal Block	Terminal Block
ENCLOSURE PROTECTION				
UL Type	Type 12/3R/4 Standard 4X Optional		Type 12/3R/4 Standard 4X Optional	
SOUND LEVEL				
At 1.5 M	56 dBA		56 dBA	
UNIT CONSTRUCTION				
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard		Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS				
Height (in./mm)	33/838.2	33/838.2	33/838.2	33/838.2
Width (in./mm)	15.7/398.8	15.7/398.8	15.7/398.8	15.7/398.8
Depth (in./mm)	8.1/205.7	8.1/205.7	8.1/205.7	8.1/205.7
Weight (lb./kg)	45/20.4	45/20.4	45/20.4	45/20.4

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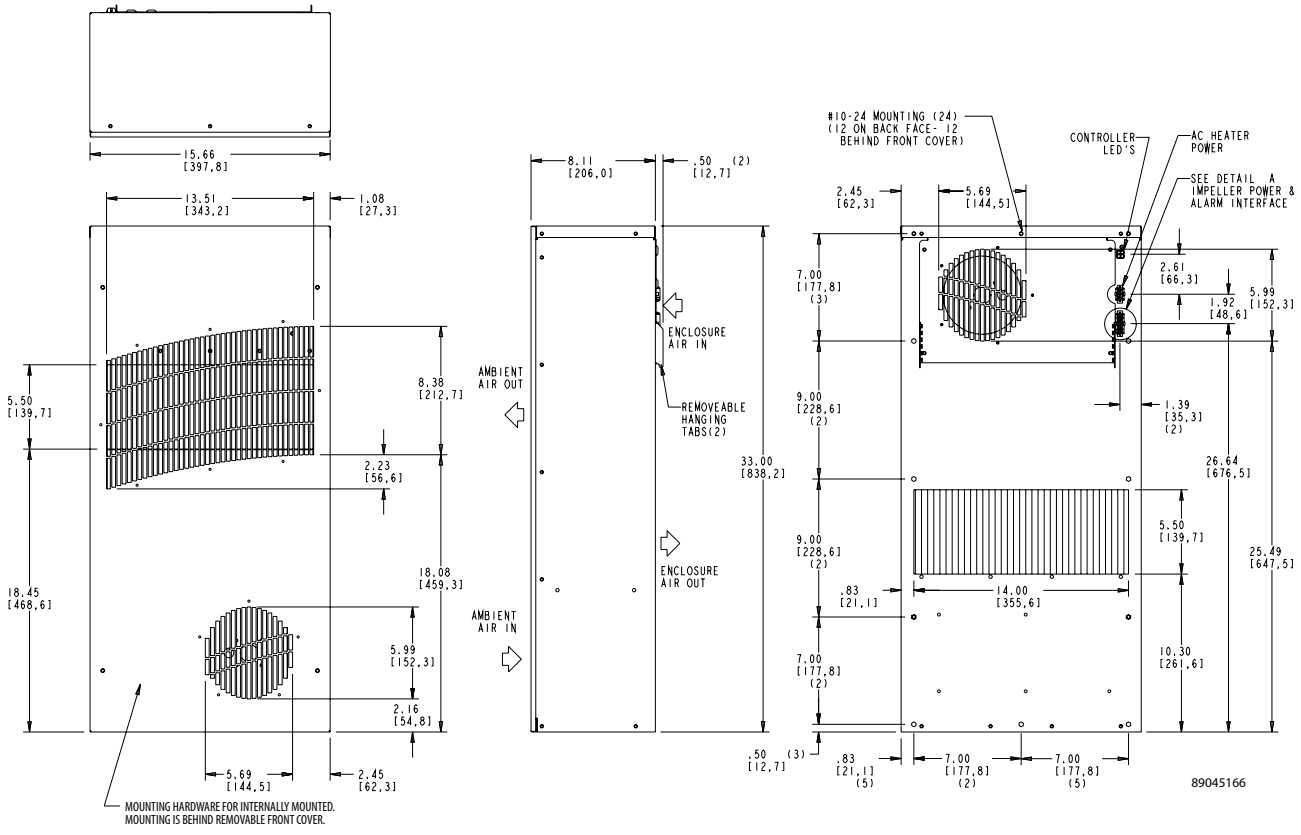
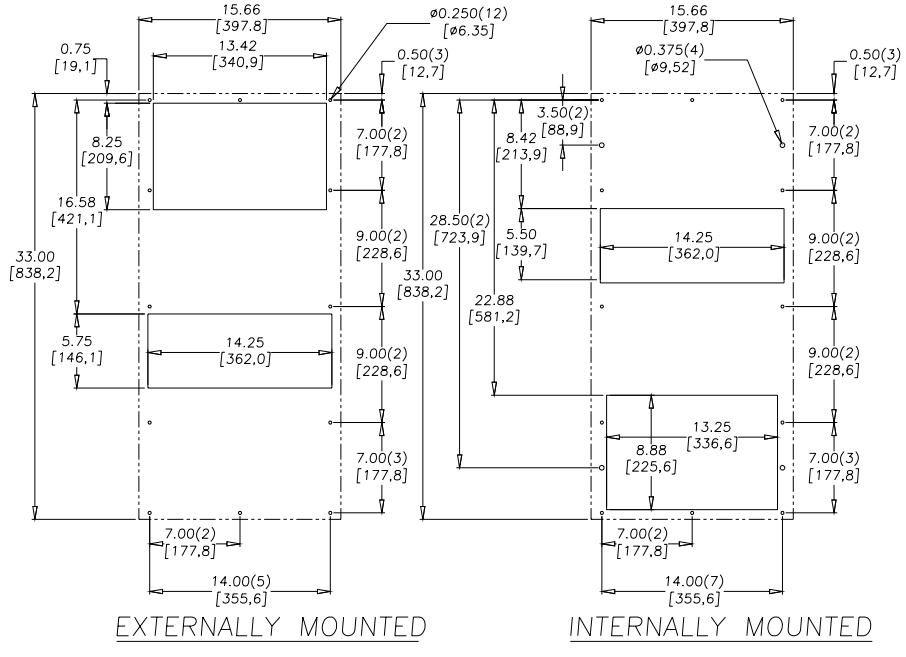
CLIMAGUARD™ Outdoor Heat Exchanger

TX33 DC Models 28 W/°F (50 W/°C)





CUTOUT INSTRUCTIONS
(AS VIEWED FROM OUTSIDE OF ENCLOSURE)

NOTES:
1. DASHED LINES REPRESENT HEAT EXCHANGER.

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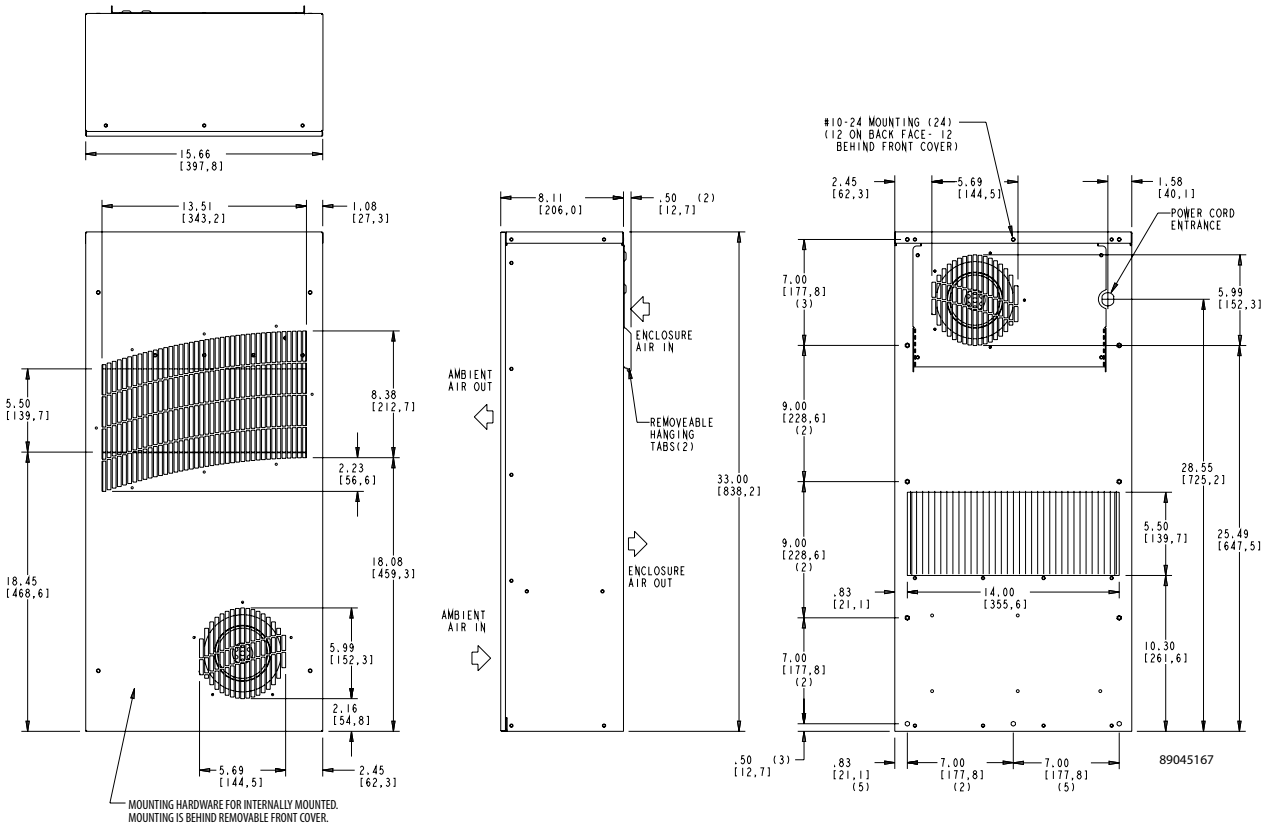
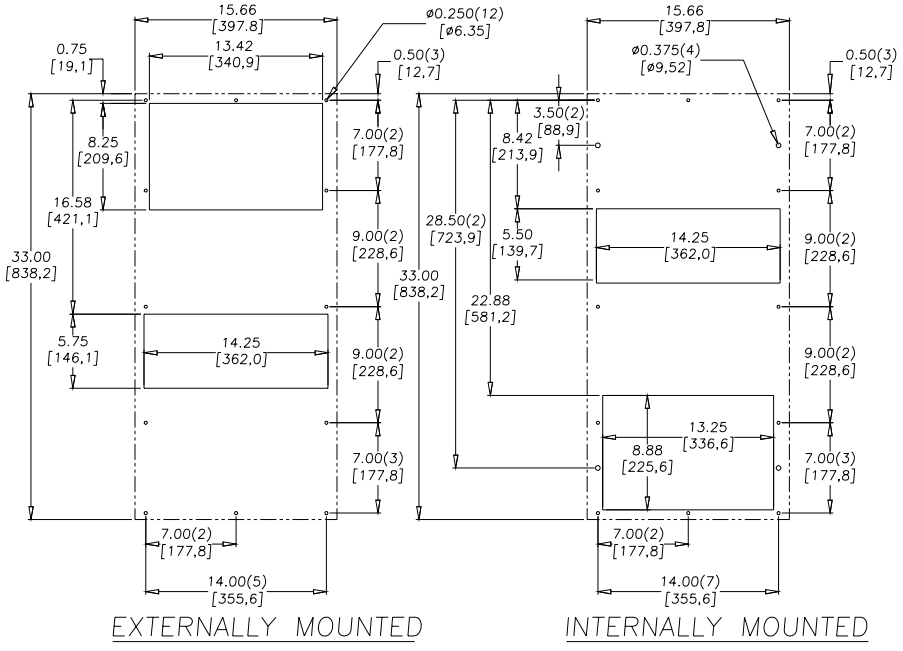
CLIMAGUARD™ Outdoor Heat Exchanger

TX33 AC Models 28 W/°F (50 W/°C)





CUTOUT INSTRUCTIONS
(AS VIEWED FROM OUTSIDE OF ENCLOSURE)

NOTES:
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CLIMAGUARD™ Outdoor Heat Exchanger

Performance Data **TX38 Models 56 W/°F (100 W/°C)**

MODEL NUMBER	TX38-5616-100	TX38-5626-100	TX38-5624-100	TX38-5648-100
COOLING PERFORMANCE				
Nominal:				
Watts per °F	**56**	**56**	**56**	**56**
Watts per °C	**100**	**100**	**100**	**100**
Refrigerant	N/A	N/A	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A	N/A	N/A
Operating Temperature Range:				
Maximum (°F/°C)	149/65	149/65	149/65	149/65
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:				
Internal loop 50 Hz (CFM/M³/Hr.)	425/722	425/722	N/A	N/A
External loop 50 Hz (CFM/M³/Hr.)	461/738	461/738	N/A	N/A
Internal loop 60 Hz (CFM/M³/Hr.)	477/810	477/810	368/625	368/625
External loop 60 Hz (CFM/M³/Hr.)	517/878	517/878	422/717	422/717
ELECTRICAL DATA				
Rated Voltage	**115 VAC**	**230 VAC**	**24 VDC**	**48 VDC**
Frequency (Hz)	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	368	276	207	279
Max. Nominal Current (Amps at 50/60 Hz)	2.3/3.2	0.7/1.2	8.6	5.8
Agency Approvals	cUL Listed CE		cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	Terminal Block	Terminal Block
ENCLOSURE PROTECTION				
UL Type	Type 12/3R/4 Standard 4X Optional		Type 12/3R/4 Standard 4X Optional	
SOUND LEVEL				
At 1.5 M	64 dBA		64 dBA	
UNIT CONSTRUCTION				
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard		Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS				
Height (in./mm)	38/965.2	38/965.2	38/965.2	38/965.2
Width (in./mm)	19.7/500.4	19.7/500.4	19.7/500.4	19.7/500.4
Depth (in./mm)	10.1/256.5	10.1/256.5	10.1/256.5	10.1/256.5
Weight (lb./kg)	66/30	66/30	66/30	66/30

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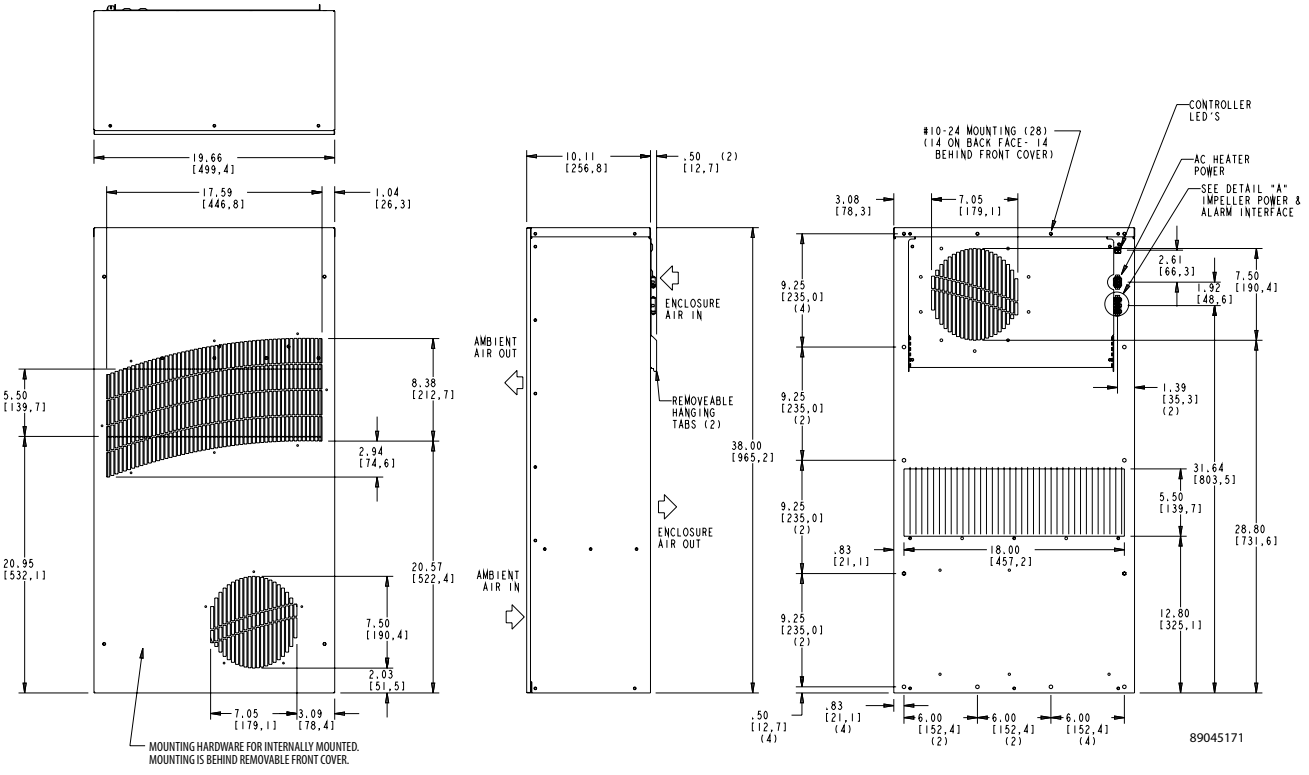
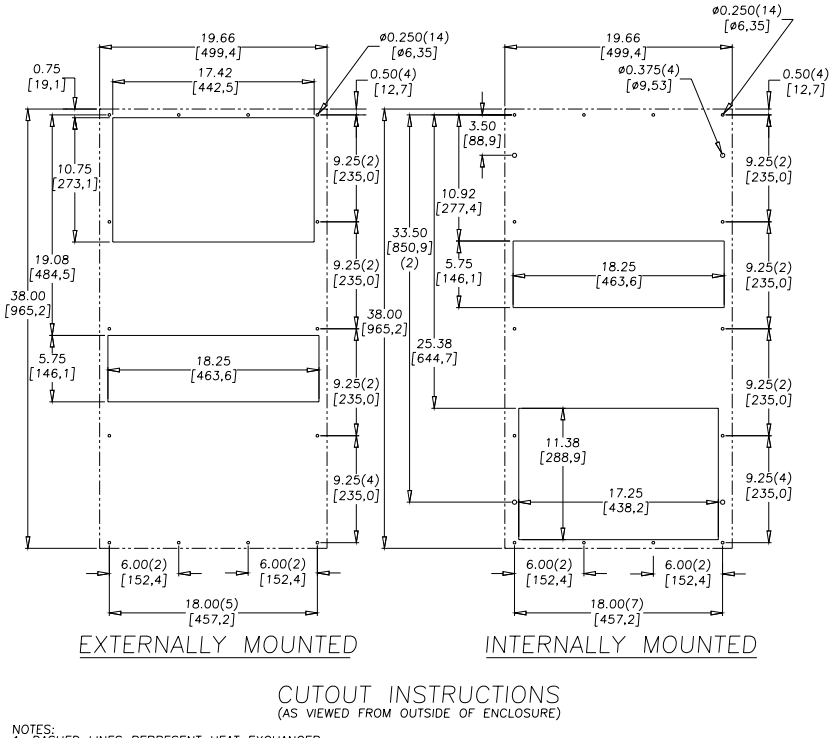
CLIMAGUARD™ Outdoor Heat Exchanger

TX38 DC Models 56 W/°F (100 W/°C)





NOTES:
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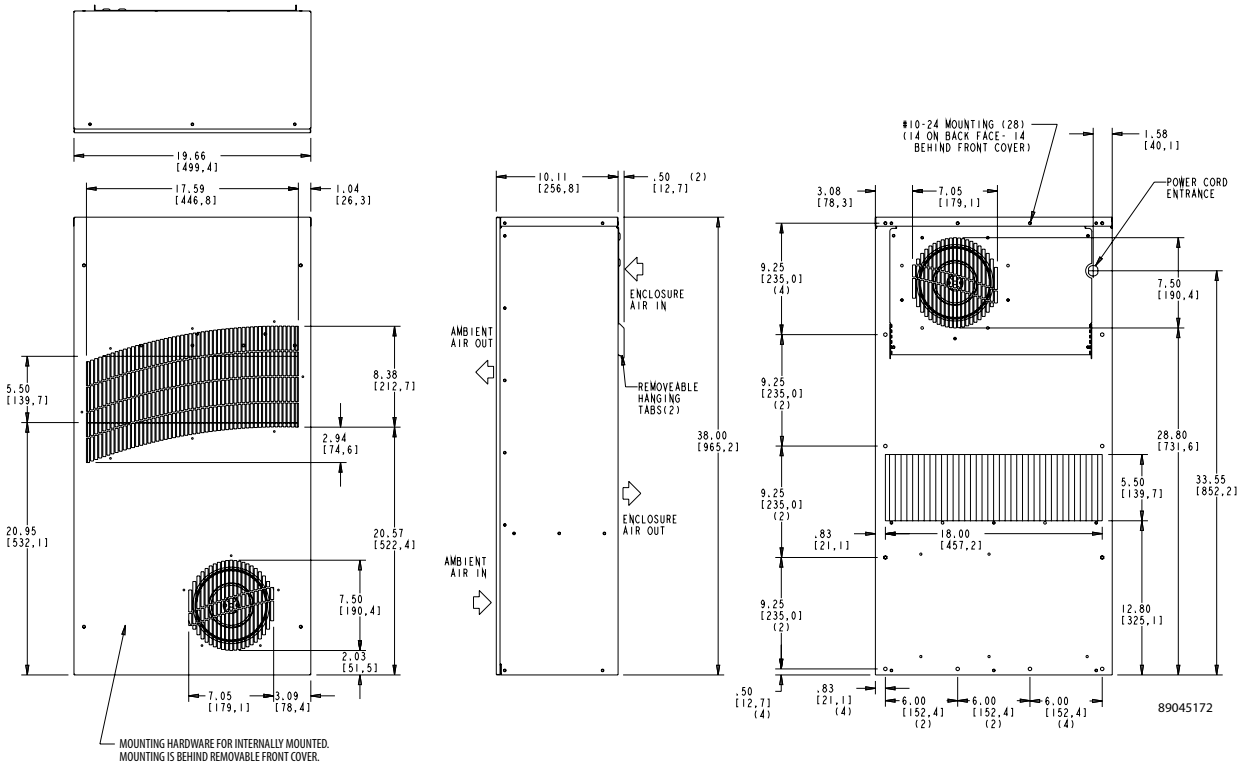
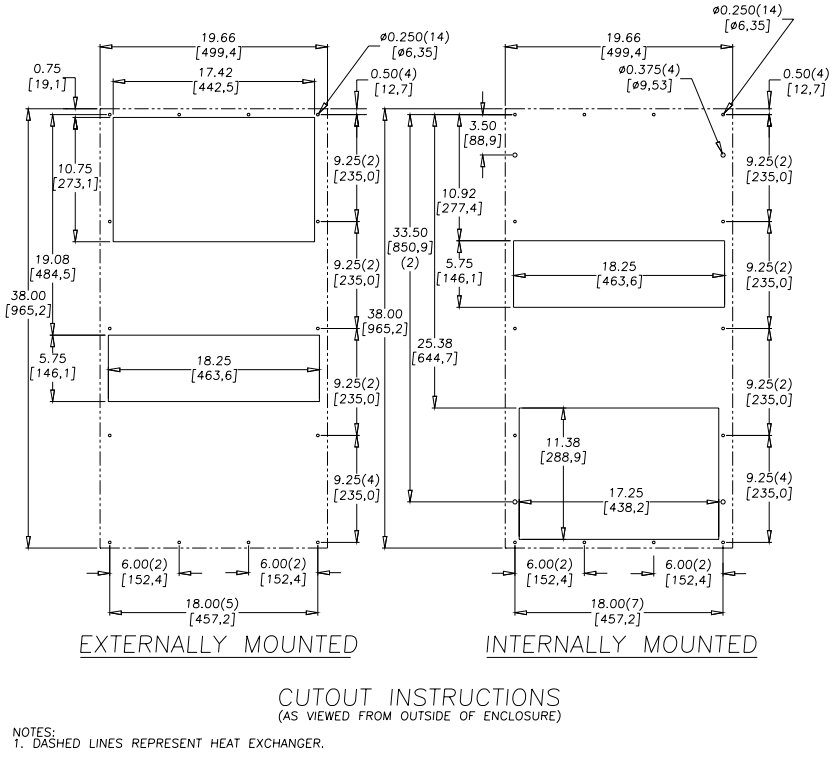
CLIMAGUARD™ Outdoor Heat Exchanger

TX38 AC Models 56 W/°F (100 W/°C)





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CLIMAGUARD™ Outdoor Heat Exchanger

Performance Data **TX52 Models 83 W/°F (150 W/°C)**

MODEL NUMBER	TX52-8316-100	TX52-8326-100	TX52-8324-100	TX52-8348-100
COOLING PERFORMANCE				
Nominal:				
Watts per °F	**83**	**83**	**83**	**83**
Watts per °C	**150**	**150**	**150**	**150**
Refrigerant	N/A	N/A	N/A	N/A
Refrigerant Charge (ounces/grams)	N/A	N/A	N/A	N/A
Operating Temperature Range:				
Maximum (°F/°C)	149/65	149/65	149/65	149/65
Minimum (°F/°C)	-40/-40	-40/-40	-40/-40	-40/-40
Air Flow at 0 Static Pressure:				
Internal loop 50 Hz (CFM/M^3/Hr.)	495/841	495/841	N/A	N/A
External loop 50 Hz (CFM/M^3/Hr.)	540/917	540/917	N/A	N/A
Internal loop 60 Hz (CFM/M^3/Hr.)	533/905	533/905	466/792	466/792
External loop 60 Hz (CFM/M^3/Hr.)	605/1028	605/1028	547/929	547/929
ELECTRICAL DATA				
Rated Voltage	**115 VAC**	**230 VAC**	**24 VDC**	**48 VDC**
Frequency (Hz)	50/60	50/60	50/60	50/60
Operating Range	+/- 10%	+/- 10%	+/- 10%	+/- 10%
Max. Power Consumption (Watts at 50/60 Hz)	782	771	507	375
Max. Nominal Current (Amps at 50/60 Hz)	4.3/6.7	2.2/3.4	21.1	7.8
Agency Approvals	cUL Listed CE		cUL Listed CE	
Power Input Description	NEMA 5-15 plug on 6-ft. cord	NEMA 6-15 plug on 6-ft. cord	Terminal Block	Terminal Block
ENCLOSURE PROTECTION				
UL Type	Type 12/3R/4 Standard 4X Optional		Type 12/3R/4 Standard 4X Optional	
SOUND LEVEL				
At 1.5 M	68 dBA		68 dBA	
UNIT CONSTRUCTION				
Material	Mild Steel Sheet Metal Standard Stainless Steel Optional		Mild Steel Sheet Metal Standard Stainless Steel Optional	
Finish	Powder Coat ANSI 70 Light Gray Standard		Powder Coat ANSI 70 Light Gray Standard	
UNIT DIMENSIONS				
Height (in./mm)	52/1320.8	52/1320.8	52/1320.8	52/1320.8
Width (in./mm)	19.7/500.4	19.7/500.4	19.7/500.4	19.7/500.4
Depth (in./mm)	10.1/256.5	10.1/256.5	10.1/256.5	10.1/256.5
Weight (lb./kg)	100/45.3	100/45.3	100/45.3	100/45.3

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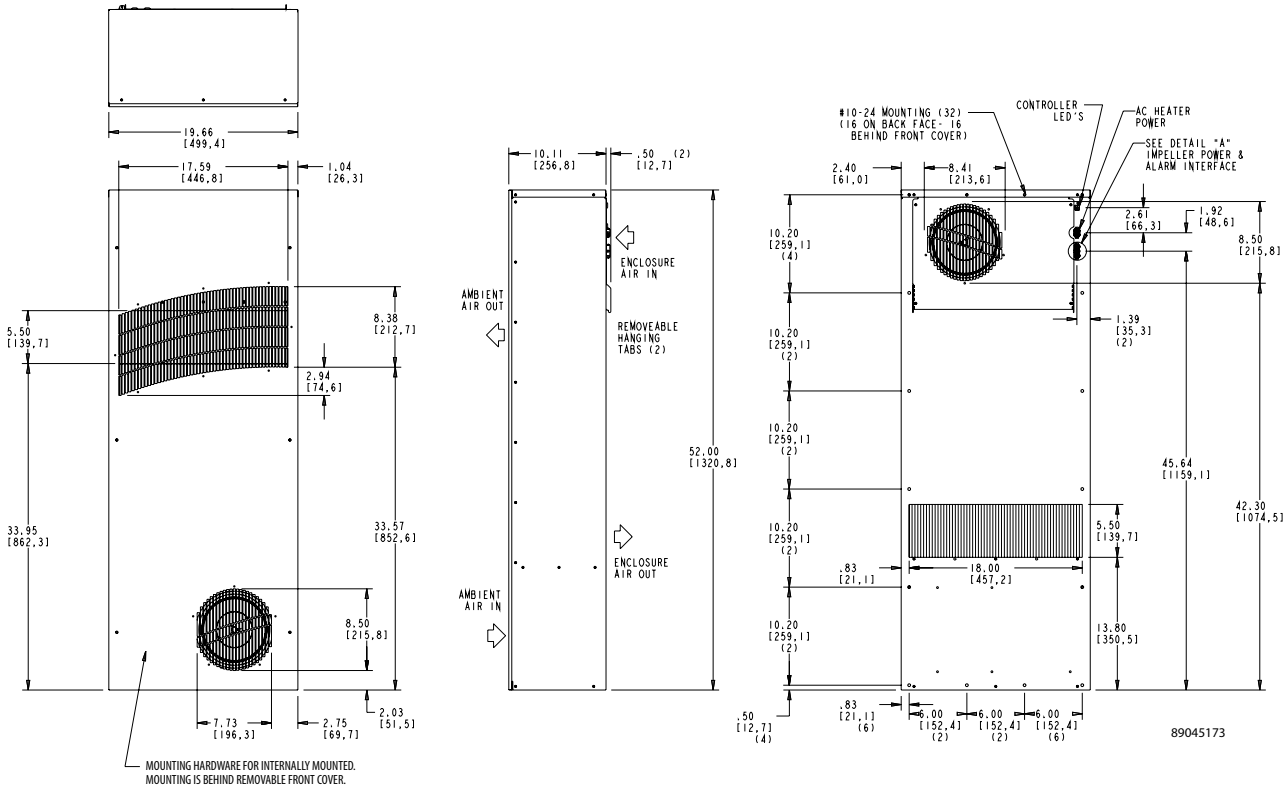
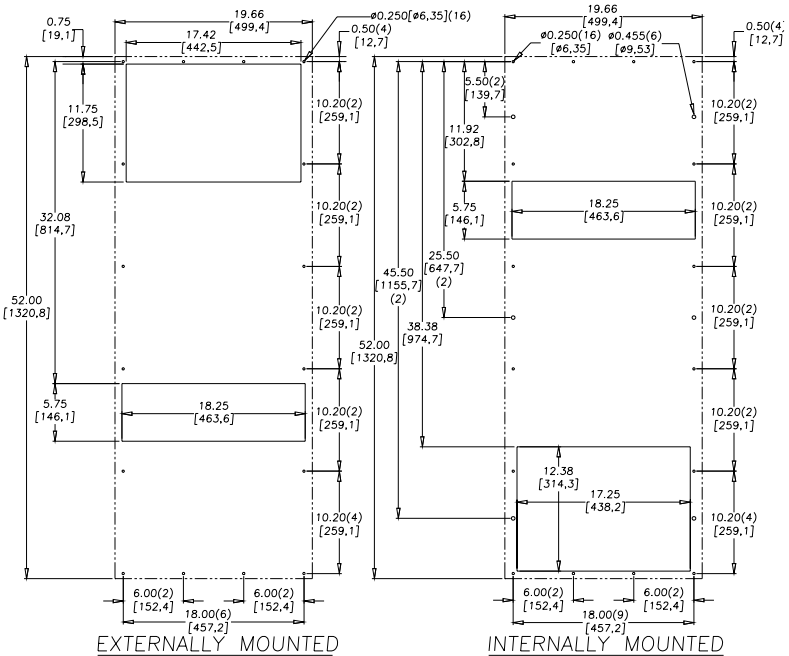
CLIMAGUARD™ Outdoor Heat Exchanger

TX52 DC Models 83 W/°F (150 W/°C)





CUTOUT INSTRUCTIONS
(AS VIEWED FROM OUTSIDE OF ENCLOSURE)

NOTES:
1. DASHED LINES REPRESENT HEAT EXCHANGER.

Visit www.McLeanCoolingTech.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

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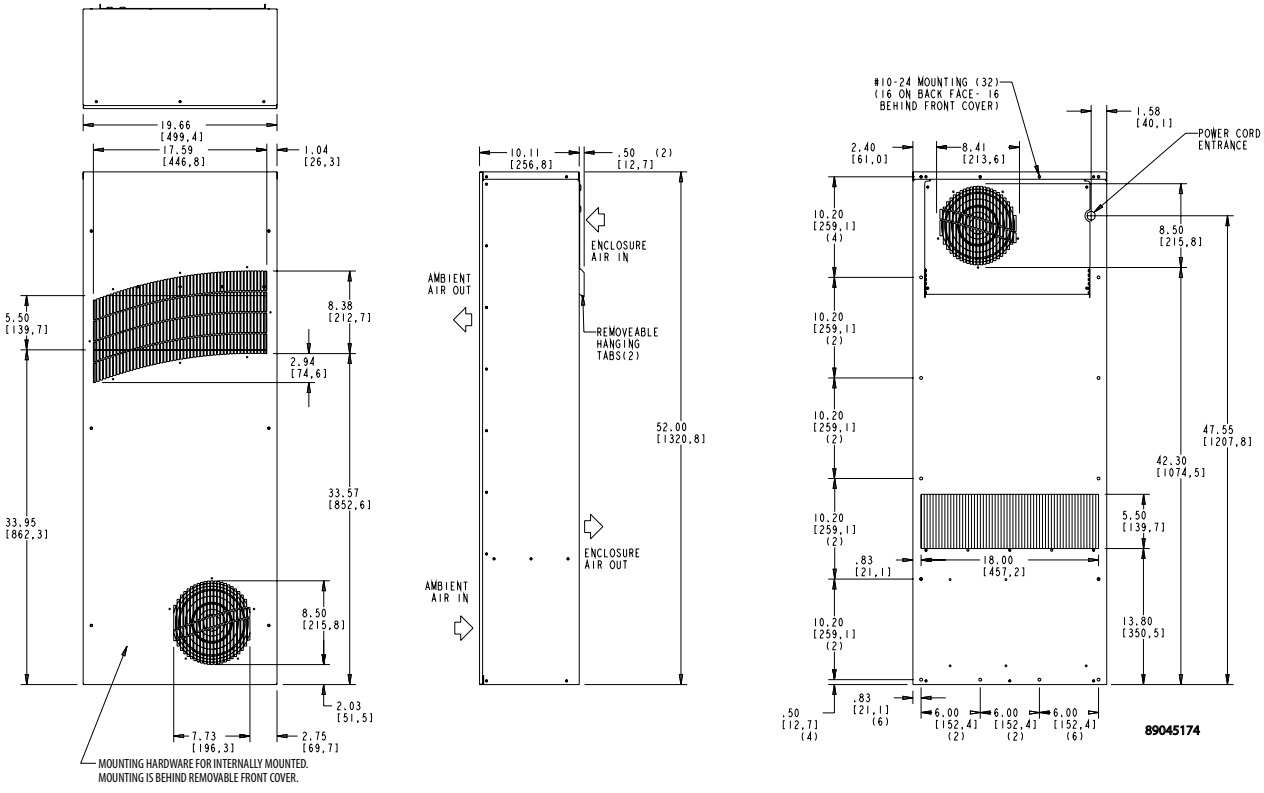
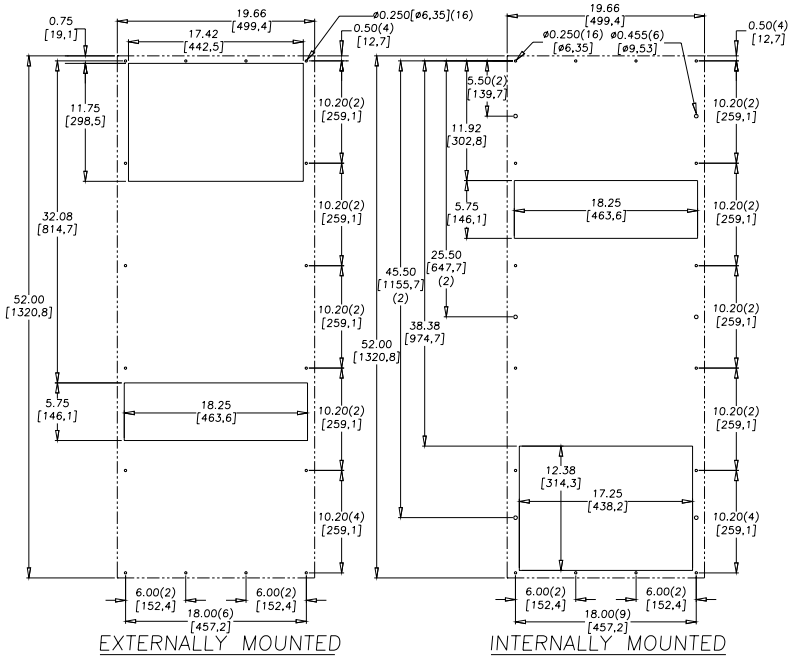
CLIMAGUARD™ Outdoor Heat Exchanger

TX52 AC Models 83 W/°F (150 W/°C)





Visit www.McLeanCoolingTech.com to download 2D and 3D CAD drawings into the overall design of your electronic system.

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Notes

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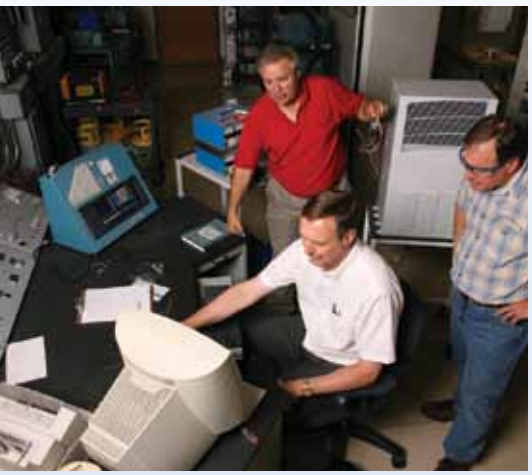
Engineered Protective Cooling Solutions



From simple blowers to packaged heat exchanger cores and sophisticated water-cooling devices, Pentair Technical Products designs and manufactures McLean engineered thermal management systems for virtually any electronics cooling application.

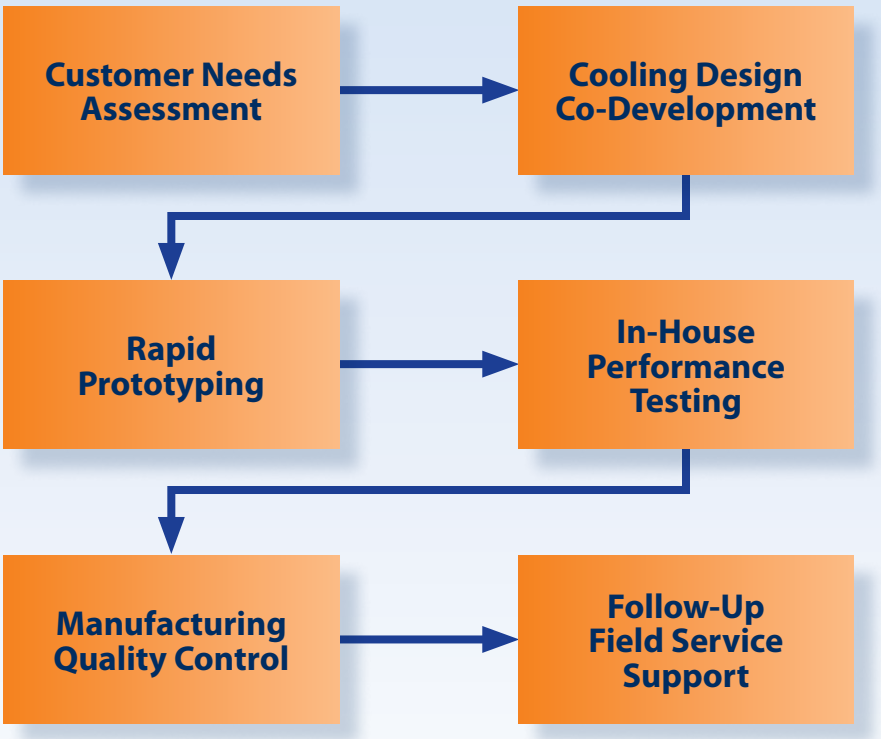
No one matches our flexibility, engineering experience and speed-to-market, thanks to these custom solution capabilities:

- 100+ combined years of thermal management engineering experience
- Rapid component prototyping
- Extensive in-house test facilities—CFD modeling, thermal cycling, salt fog, sound chamber and airflow
- UL client test data program for fast agency approvals

ENGINEERED SOLUTION PROCESS

Each design-to-spec cooling project is assigned a lead thermal engineer and supported by a dedicated cross-functional team. We then follow a proven development process from start to finish with every customer, ensuring timely and successful delivery of the engineered thermal solution.

MCLEAN ENGINEERED SOLUTION DEVELOPMENT PROCESS



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Delivered with unparalleled flexibility, engineering experience and speed-to-market

ENGINEERED AIR CONDITIONER SOLUTIONS

McLean engineered air conditioner solutions are designed and built by some of the most knowledgeable engineers in the industry. Using proven, environmentally friendly components, our experts can develop an energy-efficient, low-noise, reliable cooling system that fits your unique cooling requirements.

Pentair Technical Products also offers McLean custom electronic controls to enhance performance and protect your electronics. These intelligent control systems range from low-cost airflow sensors to complex configurations with multiple sensors monitoring and reporting cooling status, faults and remote communications.

Your engineered unit will undergo our in-house "severe conditions" test to ensure it meets your exact performance parameters. We will ensure each air conditioner meets UL, cUL, CSA, Bellcore, NEMA, IEC, European Safety and FCC compliances and standards. On-site UL certification is also available.

ENGINEERED HEAT EXCHANGER SOLUTIONS

Pentair Technical Products cooling experts work closely with your project team to design, develop and manufacture engineered heat exchanger solutions to your exact specifications. Engineered units are available with AC and DC high-efficiency air movers or DC-only with a battery backup.

We offer corrosion-resistant designs and finishes such as conversion coating, powder paint and chromate. Intelligent controls can be added with functions you specify, including speed control, fault indication, diagnostics, power conditioning, filtering and RS232 and I2C communications.

Using proprietary software to develop custom heat exchanger prototypes, we can test several unit dimensions and predict performance prior to build. And if your lead time is short, prototypes can often be manufactured in less than two weeks.

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Terms and Conditions

Order Acceptance and Payment Terms
All purchase orders must be in writing and are subject to Pentair Technical Products credit approval. Minimum order amount is $50 but subject to minimum buys of purchased parts. Payment terms are net thirty (30) days from invoice date, with a 1.5% per month (eighteen (18%) per annum) finance charge on overdue amounts. All freight will be prepaid and added to the invoice, unless otherwise specified by the Buyer. If the price includes transportation or other shipping charges, any increase in transportation rates or other shipping charges from date of quotation or purchase order shall be paid by Buyer.

Prices
Notwithstanding, Pentair Technical Products reserves the right to adjust prices at any time in order to reflect increases in the cost to Pentair Technical Products of any of the raw materials, component parts, or freight or transportation expenses necessary to produce and deliver the Products. In addition, Pentair Technical Products reserves the right to adjust the prices at any time in order to reflect fluctuations in currency valuation or exchange rates.

Shipment
Shipment is F.O.B. Pentair Technical Products plant or other place of manufacture, unless otherwise specified. The risk of loss of the Goods (including damage or destruction thereto) passes to customer upon shipment. Unless shipping arrangements are specified by customer, Pentair Technical Products will make reasonable arrangements for shipment.

Shipment Damage And Claims
All shipping claims resulting from damage incurred during transit or loss of goods are the direct responsibility of the Buyer. Pentair Technical Products will provide necessary documentation, to support Buyer's direct claim with Carrier.

Buyer must notify Pentair Technical Products and the carrier within seven (7) days of the receipt of Goods of any damage to, or partial loss of, the Goods during transit. Buyer must also notify Pentair Technical Products and the carrier within fourteen (14) days from shipment of any non-delivery of the Goods. Failure to give such timely notice relieves Pentair Technical Products of the responsibility of supporting Buyer's claim.

Delivery
Pentair Technical Products will use reasonable commercial efforts to fill orders within the time stated, but the stated delivery date is approximate only, and Pentair Technical Products reserves the right to re-adjust delivery dates. Under no circumstances will Pentair Technical Products be responsible for or incur any liability for damages, costs or expenses of any nature (whether general, consequential, as a penalty or as liquidated damages or otherwise) due to any delays in delivery, or failure to make delivery at an agreed or specified time due to circumstances beyond Pentair Technical Products' reasonable control. Acceptance by Buyer of the Goods when received waives any claim for loss or damage resulting from a delay, regardless of the cause of the delay. If shipment is delayed or suspended by Buyer, Buyer shall pay the invoice price for the Goods as per payment terms, together with Pentair Technical Products' handling and storage charges in effect and demurrage charges if loaded on rail cars.

Order Changes, Push Outs And Expedites
All change order requests must be submitted in writing. Requests will be reviewed for viability and approval is at the discretion of Pentair Technical Products. Change orders are not valid until acknowledged by Pentair Technical Products. Orders may not be placed on indefinite hold. Order push-out requests must be accompanied with firm rescheduled ship dates and may be subject to an additional Pentair Technical Products carrying charge of 1.67% per month for handling and storage. Expedited delivery requests will be reviewed case by case. Expedite fees are 20% of order premium plus all vendor expedite charges.

Specifications
Pentair Technical Products may, at its option, make changes in the design, construction, arrangement or components of the Goods if, in Pentair Technical Products' judgment, such changes will be beneficial to the operation of the Goods. Buyer may not make any changes in the specifications for the Goods unless Pentair Technical Products approves of such changes by a signed writing, in which event Pentair Technical Products may make additional charges for such changes.

Cancellation
Buyer may not cancel orders placed with Pentair Technical Products, except with Pentair Technical Products' written consent and then only if Buyer makes payment to Pentair Technical Products to indemnify it against loss, including but not limited to expenses incurred and commitments made by Pentair Technical Products. In addition to such charges previously mentioned, any cancellations approved by Pentair Technical Products shall be subject to a cancellation charge of fifteen percent (15%) of the net price. If modifications, specifically ordered by the Buyer, are being made to the cancelled merchandise, the cancellation charge will also include the cost for such modifications made up to the date of cancellation.

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Terms and Conditions - Warranty

Warranty

Pentair Technical Products warrants that the Goods manufactured by Pentair Technical Products will be free from defects in material and workmanship for a period of one (1) year from the date of shipment by Pentair Technical Products, subject to the following conditions and exclusions:

A. Conditions

All Goods must be installed and operated according to the following specifications:

1. Maximum voltage variation no greater than plus or minus 10% of nameplate nominal rating
2. Maximum frequency variation no greater than plus or minus 3 Hz. of nameplate nominal rating
3. Must not exceed minimum and maximum stated temperatures on the nameplate
4. Must not exceed (BTU/Hr) rating, including any heat sink as indicated on the nameplate
5. Refrigerant bearing Goods must not be restarted for a period of one (1) minute after intentional or accidental shut-off
6. The filters (if applicable) must be cleaned regularly
7. The Goods and any parts thereof must not be modified, unless prior written authorization is received from Pentair Technical Products
8. All Goods must be installed and grounded in accordance with all relevant electrical and safety codes, as well as the National Electric Code and OSHA rules and regulations
9. All Goods must be installed in a stationery application, free of vibration

A violation of any one of these conditions shall render the warranty hereunder void and of no effect.

B. Exclusions

This warranty shall be void if product is misapplied in any way or:

1. Buyer specified product is inappropriate for system or environment it is operating in
2. Pentair Technical Products product modified in any way without prior written authorization from Pentair Technical Products
3. Removal or modification of Pentair Technical Products label affixed to product without written Pentair Technical Products approval

Pentair Technical Products must be notified of a claim in writing not later than fourteen (14) days from the date when Buyer has become aware of such occurrence, or where the defect is such that it may cause damage, immediately, such notice containing a description of how the defect manifests itself. Failure to provide such prompt notice to Pentair Technical Products shall result in forfeiture of Buyer's rights under this warranty.

In the event of a warranty claim, Buyer is to return defective goods to Pentair Technical Products in accordance with Pentair Technical Products Return Policy. Warranty period for repaired goods remains at 1 year from shipment of original goods. Pentair Technical Products' sole obligation to Buyer under this warranty will be, at Pentair Technical Products' option:

A. Repair or replace Pentair Technical Products McLean brand products or parts found to be defective in material or workmanship
B. Issue credit for the purchase price paid by Buyer relating to such defective Goods or part

THIS WARRANTY CONSTITUTES THE ENTIRE WARRANTY WITH RESPECT TO THE GOODS AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

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Terms and Conditions - Warranty

Return and Repair Policy

McLean brand products that: (i) are made to order, (ii) have been modified by Buyer, (iii) have special finishes, or (iv) are determined by Pentair Technical Products to constitute "custom" products that cannot be returned to stock or resold to other Buyers, will not be accepted for return by Pentair Technical Products.

All returns require a Return Material Authorization number (RMA #), regardless of reason for return, whether it be for warranty or out of warranty repair. Returns without an RMA # will be refused by our Receiving Department. An RMA # is valid for 60 days.

A. An RMA # will be issued by our Repair Department in Anoka, MN at 763-422-2277 or 800-896-2665 (toll free in the US). After hours call 888-632-0092. Buyer should have the following information available at time of RMA request:
   1. Complete Model Number, Serial Number and description of damaged unit being returned
   2. Original Buyer Purchase Order number and date product was received by Buyer
   3. Quantity to be returned and a brief description of failure for each unit, if different
   4. Contact information of Buyer that must include: name of company, billing and shipping address, phone number, fax number, freight carrier, and the name and phone number of a Buyer contact who can elaborate on the claimed defect in detail
   5. Buyer must provide a Repair Purchase Order number for both warranty and out of warranty repairs. The PO will not exceed 50% of a new unit. Buyer will be notified of repair charges that exceed approved PO amount.

B. All returns to Pentair Technical Products must be securely packed, using original cartons if possible. All returns must have the RMA number visible on the outside of the carton. Pentair Technical Products is not responsible for material damaged in transit. Any refrigerant-bearing Goods must be shipped upright for return.

C. Shipping cost for all non-warranty repairs is the responsibility of the sender and must be shipped prepaid. Shipping costs for all warranty related repairs will be covered by Pentair Technical Products provided the goods are returned using a Pentair Technical Products approved carrier. If after diagnosis the product is determined by Pentair Technical Products not be covered under warranty, Buyer will be responsible for all shipping charges and will be billed accordingly.

D. Non-warranty repairs are subject to a $75 minimum analysis fee. Analysis fee will be waived if Buyer approves repair work. If approval is not received within 30 days, material will be scrapped and all shipping expenses and corresponding analysis fees will be billed to Buyer.

E. At Buyer's request, Failure Analysis can be provided by Pentair Technical Products for warrantable goods at no charge. Failure analysis for non-warranty repairs are subject to a $100 per hour engineering charge plus any other incurred testing costs.

F. All returned merchandise must be sent to the following address: Pentair Technical Products, 2100 Hoffman Way, Anoka, MN 55303-1745

G. Credit for accepted returns shall be at the original selling price or the current selling price, whichever is lower, less the restocking charge indicated as follows:
   1. Within 60 days of invoice date - 20% of applicable selling price
   2. Within 61-120 days of invoice date - 30% of applicable selling price
   3. Within 121-180 days of invoice date - 40% of applicable selling price
   4. Beyond 180 days - subject to individual review by Pentair Technical Products

If product being returned for credit requires repair or modification, the cost of any labor or material necessary to bring product into saleable condition will be deducted from credit. Buyer may not take credit against returns without prior written Pentair Technical Products approval.

LIMITATION OF LIABILITY. PENTAIR TECHNICAL PRODUCTS WILL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, INCLUDING WITHOUT LIMITATION ANY LOST PROFITS OR LABOR COSTS, ARISING FROM THE SALE, USE OR INSTALLATION OF THE GOODS, FROM THE GOODS BEING INCORPORATED INTO OR BECOMING A COMPONENT OF ANOTHER PRODUCT, FROM ANY BREACH OF THIS AGREEMENT OR FROM ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON WARRANTY (EXPRESSED OR IMPLIED) OR OTHERWISE BASED ON CONTRACT, OR ON TORT OR OTHER THEORY OF LIABILITY, AND REGARDLESS OF ANY ADVICE OR REPRESENTATIONS THAT MAY HAVE BEEN RENDERED BY PENTAIR TECHNICAL PRODUCTS CONCERNING THE SALE, USE OR INSTALLATION OF THE GOODS.

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Notes

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Model Number Index

Model Number	Page
33-0416-GW010	107
33-0426-GW012	107
33-0426-GW014	107
CR23-0216-G002	95
CR23-0226-G002	95
CR23-0246-G400	95
CR29-0216-G002	98
CR29-0226-G002	98
CR29-0246-G400	98
CR29-0416-G002	98
CR29-0426-G002	98
CR29-0446-G400	98
CR43-0616-G002	101
CR43-0626-G002	101
CR43-0646-G400	101
CR43-0816-G002	101
CR43-0816-GW0XX	109
CR43-0826-G002	101
CR43-0826-GW0XX	109
CR43-0846-G400	101
G52-0816-G050	21
G52-0816-G150	21
G52-0826-G050	21
G52-0826-G150	21
G52-0846-G050	21
G52-0846-G150	21
G52-1216-G050	21
G52-1216-G150	21
G52-1226-G050	21
G52-1226-G150	21
G52-1246-G050	21
G52-1246-G150	21
G57-2026-G050	28
G57-2026-G150	28
G57-2046-G050	28
G57-2046-G150	28

Model Number	Page
LB11-0416-GW008	111
LB11-0426-GW010	111
M13-0116-G1014	71
M13-0116-G400	71
M13-0126-G1009	71
M17-0216-G009	73
M17-0226-G004	73
M17-0246-G1400	73
M26-0646-G400	77
M28-0216-G013	75
M28-0226-G004	75
M28-0246-G400	75
M28-0416-G007	76
M28-0426-G032	76
M28-0446-G400	76
M28-0616-G005	77
M28-0626-G005	77
M33-0416-G010	79
M33-0426-G009	79
M33-0446-G400	79
M36-0616-G307	81
M36-0626-G306	81
M36-0646-G400	81
M52-0446-G002	83
M52-0646-G002	83
M52-0846-G002	83
M52-1046-G002	83
MHB11-0216-G306	89
MHB11-0226-G306	89
MHB11-0246-G400	89
MHB11-0416-G307	90
MHB11-0426-G306	90
MHB11-0446-G400	90
T15-0116-G150	37
T15-0126-G150	37
T20-0216-G150	40

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Model Number Index

Model Number	Page
T20-0226-G150	40
T20-0246-G400	40
T29-0416-G150	43
T29-0426-G150	43
T29-0446-G400	43
T43-0616-G150	46
T43-0626-G150	46
T43-0646-G400	46
T43-0816-G150	48
T43-0826-G150	48
T43-0846-G150	48
T43-1016-G150	50
T43-1026-G150	50
T43-1046-G400	50
T50-1226-G150	53
T50-1246-G400	53
T53-1926-G150	56
T53-1946-G400	56
T62-2226-G150	59
T62-2246-G400	59
T70-3626-G150	62
T70-6026-G150	65
TX23-1416-100	135
TX23-1424-100	135
TX23-1426-100	135
TX23-1448-100	135
TX33-2816-100	139
TX33-2824-100	139
TX33-2826-100	139
TX33-2848-100	139
TX38-5616-100	141
TX38-5624-100	141
TX38-5626-100	141
TX38-5648-100	141
TX52-8316-100	145
TX52-8324-100	145
TX52-8326-100	145
TX52-8348-100	145
XR20-0216-012	117
XR20-0226-012	117
XR29-0816-012	119
XR29-0826-012	119
XR29-1816-012	121
XR29-1826-012	121
XR47-2416-012	123
XR47-2426-012	123
XR47-3516-012	125
XR47-3526-012	125
XR60-5516-012	127
XR60-5526-012	127
XR60-8416-012	129
XR60-8426-012	129

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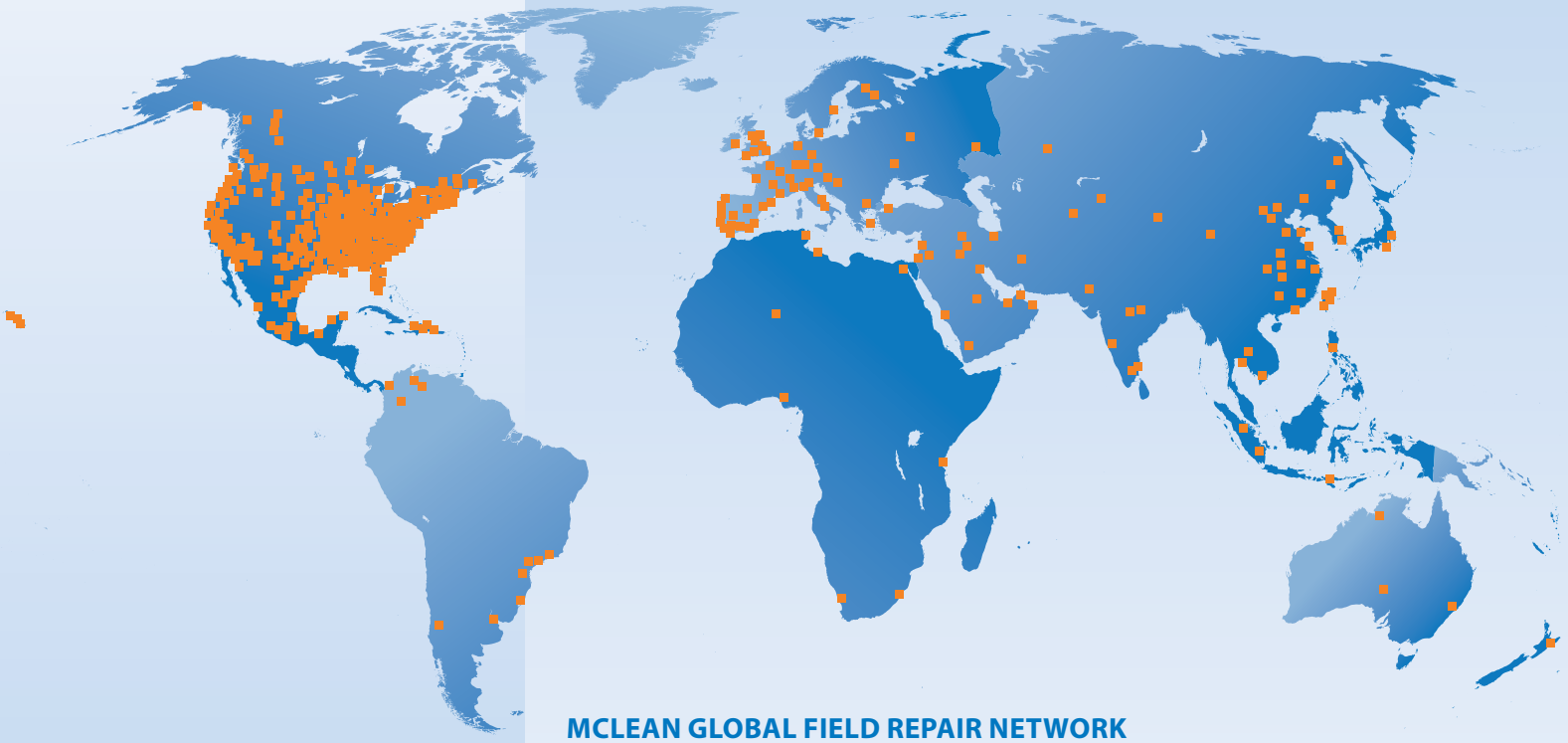
Global Field Repair Network

Over 1,000 field repair technicians worldwide

Unlike some electronics cooling companies, Pentair Technical Products comes to you or wherever your system is deployed worldwide for repair services, eliminating the hassle and wait of sending your cooling unit back to headquarters.

We have over 1,000 certified field repair technicians worldwide who have been carefully screened to conduct warranty and non-warranty work on your McLean air conditioner, heat exchanger or air mover.



24/7 emergency repair services, extended warranties and preventative maintenance programs are also available. Check with McLean aftermarket services for details.

MCLEAN GLOBAL FIELD REPAIR NETWORK

Scheduling a McLean service repair technician is easy any day and time of the week.

BY PHONE

Monday-Friday from 7:00 a.m. to 5:30 p.m. US Central time
Call McLean aftermarket services at Pentair Technical Products
1-866-545-5252 (toll-free in the US)
+1 763-422-2171 (outside the US)

After business hours, call:
Johnson-Northwest (McLean Service Partner)
1-888-632-0092

ONLINE

McLeanCoolingTech.com/Service---Repair/Repair-Service-Request.aspx

Spare Parts Store

Safe, secure and easy to use

If you wish to repair a McLean cooling unit yourself, we have two ways to order spare parts—by phone and online.

BY PHONE

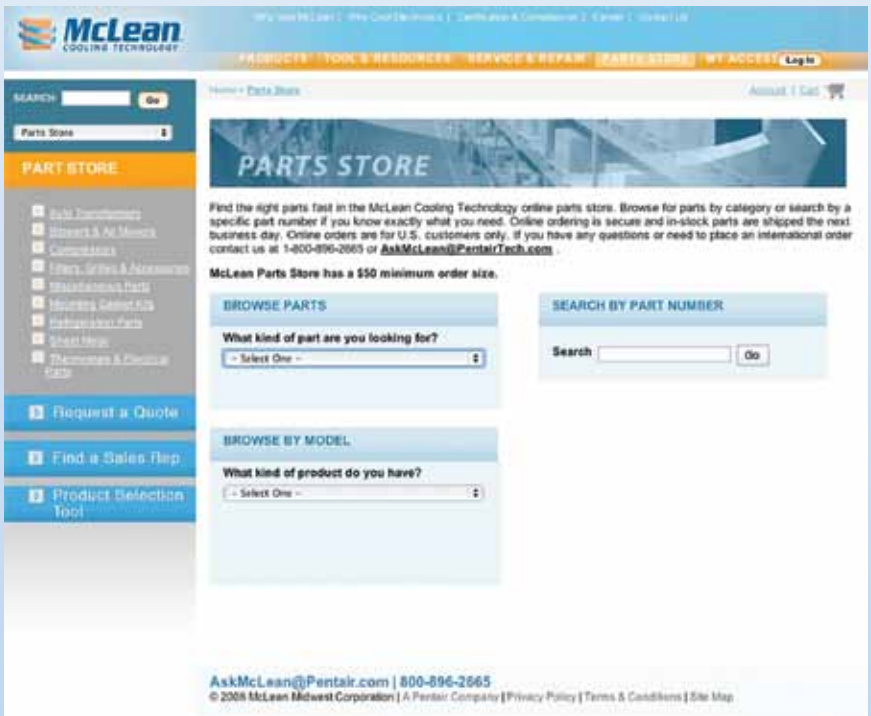
Call McLean customer service at Pentair Technical Products.

1-800-896-2665 (toll-free in the US)
+1 763-422-2277 (outside the US)

Monday-Friday from 7:00 a.m. to 5:30 p.m.
US Central time

ONLINE

The McLean online spare parts store is completely safe, secure and easy to use. Simply visit **McLeanCoolingTech.com** then click on "Parts Store" in the main menu.



MCLEAN ONLINE SPARE PARTS STORE

You can search for your McLean spare parts by part number, model number or part category. The entire online shopping experience is user friendly. And at the end of the process, you may pay by credit card, or we can send you an invoice.

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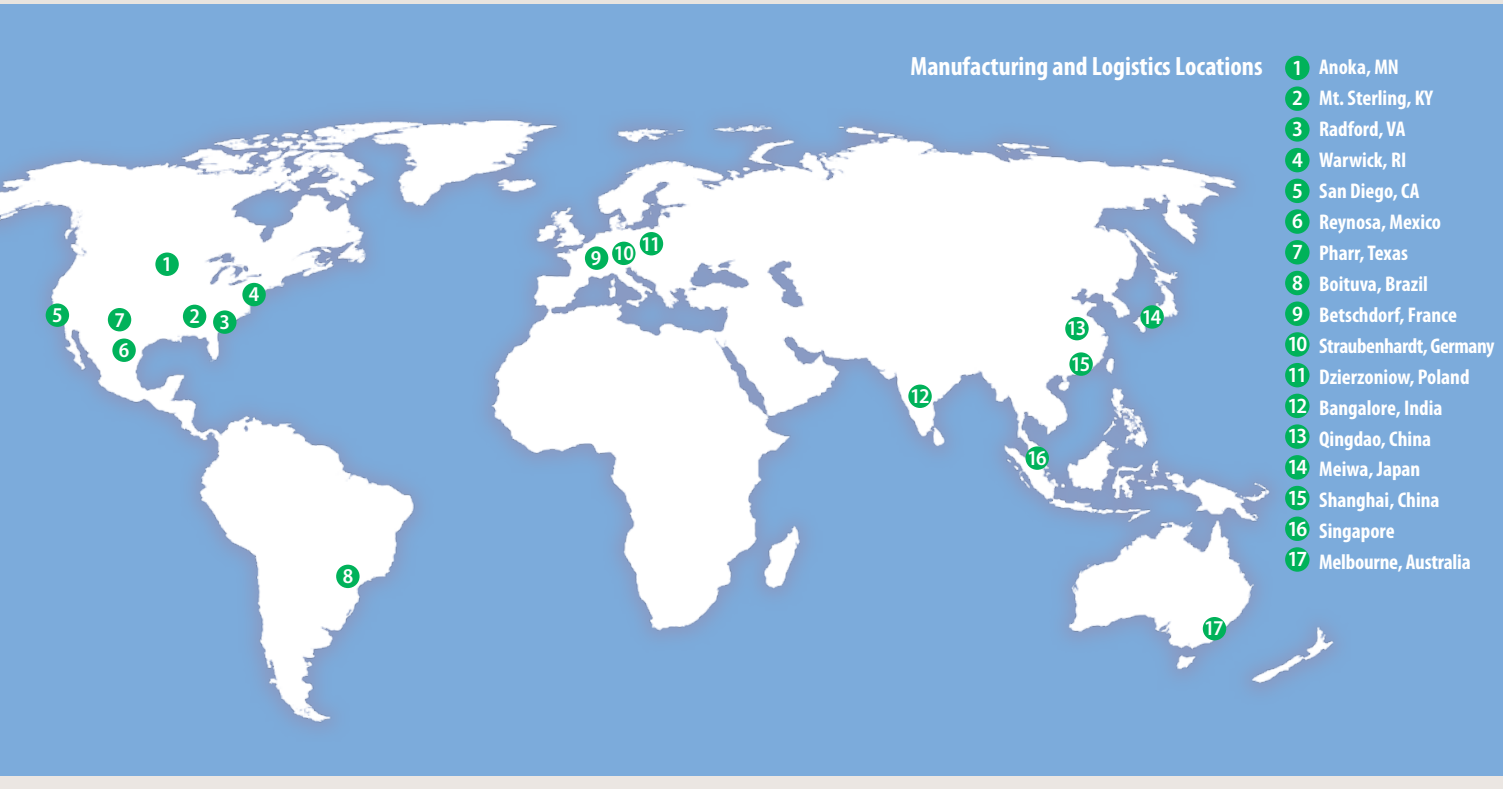
About Pentair Technical Products

Pentair Technical Products, a Pentair global business unit, is the leading provider of worldwide product and service solutions for enclosing, protecting and cooling electrical and electronic systems. Its industry-leading brands—Hoffman®, Schroff®, McLean® Cooling Technology, Calmark®, Birtcher®, Aspen Motion Technologies™ and Taunus™ —provide a broad variety of standard, modified and engineered solutions to the commercial, communications, energy, general electronics, industrial, infrastructure, medical, and security and defense markets.



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